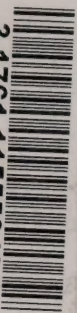


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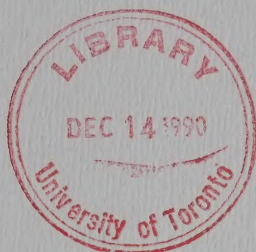
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FEDERAL ENVIRONMENTAL
ASSESSMENT REVIEW
OFFICE

BUREAU FEDERAL
D'EXAMEN DES EVALUATIONS
ENVIRONNEMENTALES



Held at/Auditions tenues au:
Le Nouvel Hotel
Montréal, Québec

Date: Thursday November 15, 1990
Jeudi le 15 novembre 1990

Volume: 13

B E F O R E / D E V A N T :

MR. BLAIR SEABORN	Chairman/Président
MS. LOUISE ROY	Member/Membre
DR. LOIS WILSON	Member/Membre
DR. LOUIS LAPIERRE	Member/Membre
DR. WILLIAM FYFE	Member/Membre
MR. PIETER van VLIET	Member/Membre

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FEDERAL ENVIRONMENTAL
ASSESSMENT REVIEW OFFICE
ON NUCLEAR FUEL WASTE
MANAGEMENT

BUREAU FÉDÉRAL D'EXAMEN
DES ÉVALUATIONS
ENVIRONNEMENTALES
DE LA GESTION DES DÉCHETS
DE COMBUSTIBLES NUCLÉAIRES

SCOPING MEETING
RÉUNIONS DE DÉTERMINATION DE L'IMPORTANCE DES PROBLEMES

Hearing held at/Auditions tenues au:
Le Nouvel Hotel, Montréal, Québec.

Thursday November 15th/Jeu di le 15 novembre
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07:00 p.m. - 19:00 heures

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MR. PIETER van VLIET	Member/Membre



(i)

A P P E A R A N C E S

MR. GORDON EDWARDS

CANADIAN COALITION FOR
NUCLEAR RESPONSIBILITY

MR. ANDREW ORKIN

LAWYERS FOR SOCIAL
RESPONSIBILITY

DR. ERIC NOTEBEART

PROFESSIONNELS DE LA
SANTÉ POUR LA
RESPONSABILITÉ NUCLEAIRE

ASSOCIATION CANADIENNE &
ASSOCIATION
INTERNATIONALE DES
MEDICINS POUR LA
PREVENTION DE LA GUERRE
NUCLEAIRE

MRS. MARY EVANS BAPST

PRIVATE CITIZEN



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MRS. EVANS BAPST	75



1 ---La séance commence à 19h10.

2 LE PRÉSIDENT: Bonsoir mesdames, bonsoir
3 messieurs, soyez les bienvenus à ces réunions de
4 détermination de l'importance des problèmes tenues par
5 la Commission d'Evaluation Environnementale, chargée de
6 l'examen du concept de gestion et de stockage des
7 déchets de combustibles nucléaires. Cette commission a
8 été établie par le ministre de l'environnement le 4
9 octobre 1989.

10 La présente réunion sera tenue et en
11 français et en anglais. Il y a un service de
12 traduction si vous y tenez, qui vous permettra de
13 suivre les discussions en l'une ou l'autre des deux (2)
14 langues.

15 Et il va sans dire qu'on peut présenter
16 les points de vue ou en anglais ou en français. Les
17 écouteurs sont disponibles au fond de la salle.

18 Permettez-moi d'abord de vous présenter
19 les membres de la Commission qui sont avec moi ce soir:
20 A ma gauche, à l'extrême -- votre droite, de cette
21 table, monsieur Pieter Van Vliet de Régina, il est
22 ingénieur en mécanique, aussi membre du Sénat de
23 l'Université de Régina.

24 A côté de monsieur Van Vliet, madame Lois
25 Wilson de Toronto, présidente du Conseil Mondial des



1 Eglises et co-directrice du Forum Oecuménique du
2 Canada.

3 A ma gauche immédiate ainsi, monsieur
4 Louis LaPierre de Moncton, professeur au département de
5 biologie de l'Université de Moncton et président du
6 Conseil de l'Environnement du Nouveau-Brunswick.

7 A ma droite, madame Louise Roy de
8 Montréal, consultante dans le domaine de
9 l'environnement et des affaires publiques. Madame Roy
10 a été vice-présidente du Bureau d'Audiences Publiques
11 de l'Environnement, elle est présentement membre du
12 Conseil Canadien de Recherches sur l'Evaluation
13 Environnementale.

14 Et à ma droite, à côté de madame Roy,
15 monsieur William Fyfe, de Londres, Ontario, professeur
16 de géologie à l'Université de Western Ontario où il est
17 doyen de la faculté des sciences.

18 Mon nom est Blair Seaborn et je suis le
19 président de la commission. J'habite Ottawa, je suis
20 actuellement à la retraite mais précédemment, j'étais
21 sous-ministre de l'environnement et président de la
22 Commission Mixte Internationale.

23 Les membres aussi du secrétariat, je
24 voudrais bien présenter, à la table à gauche ici,
25 monsieur Bob Greyell, qui est secrétaire-exécutif de la



1 commission.

2 Et au fond de la salle, madame Suzan
3 Toller et madame Suzan Flanagan, toutes les deux qui
4 sont membres de notre secrétariat et qui sont là pour
5 vous aider si on en a besoin, au courant de la soirée.

6 Cet examen est effectué conformément aux
7 Processus Fédéral d'Evaluation et d'Examen en matière
8 d'Environnement.

9 Ce processus assure que les implications
10 environnementales de propositions pour lesquelles le
11 gouvernement fédéral qui est l'autorité décisionnelle,
12 soient prises en considération le plus tôt possible,
13 lors du processus de planification, avant que des
14 décisions irrévocables soient prises.

15 J'espère que certains parmi vous auront eu
16 l'occasion lors des jours d'accueil en mai et juin de
17 cette année, de recevoir de l'information au sujet de
18 ce processus d'examen et de la proposition d'Energie
19 Atomique du Canada Limitée.

20 Une des demandes faites à la commission
21 est d'examiner un concept de gestion et de stockage des
22 déchets de combustible nucléaire, qui consiste à
23 stocker de façon permanente le combustible irradié dans
24 les couches profondes de la roche granitique du
25 bouclier canadien.



1 Cette proposition, la proposition de
2 l'AECL, les déchets de combustible nucléaire seraient
3 scellés dans des containers résistant à la
4 corrosion. Ces containers seraient ensuite placés dans
5 des trous creusés dans le sol des chambres de stockage.
6 Le réseau souterrain de galeries et de chambres de
7 stockage ainsi semblable à une mine profonde,
8 occuperait une superficie d'environ quatre (4)
9 kilomètres carrés.

10 J'aimerais aussi vous dire quelques mots
11 au sujet du mandat de la commission. La commission est
12 entre autres, chargée d'examiner la sécurité et
13 l'acceptabilité du concept proposé par l'AECL que je
14 viens de décrire.

15 La commission est aussi chargée d'examiner
16 un large éventail de questions relatives à la gestion
17 des déchets de combustible nucléaire y compris leur
18 gestion à long terme, leur transport et leurs impacts
19 environnementaux et socio-économiques.

20 Elle étudiera également des diverses
21 approches développées ailleurs dans le monde en
22 matière de gestion et de stockage des déchets de
23 combustibles nucléaires.

24 Etant donné qu'aucune sélection d'un
25 emplacement de stockage ne sera faite avant que le



1 concept soit considéré comme sûr, la commission ne
2 déterminera pas d'emplacement mais examinera seulement
3 la carte générale d'emplacements éventuels ainsi que
4 les méthodes requises pour définir les caractéristiques
5 des tels emplacements.

6 Après avoir dit ce qui est inclus dans le
7 mandat de la commission, il est nécessaire que je vous
8 dise maintenant ce qui n'est pas inclus, ce qui est
9 exclus et ne sera donc pas traité dans cet examen.

10 Ne sont pas couverts par le mandat, les
11 politiques énergétiques du Canada et de ses provinces,
12 le rôle de l'énergie nucléaire dans ces politiques y
13 compris la construction, l'exploitation et la sécurité
14 des centrales nucléaires tant existantes que futures.

15 Re-traitement du combustible en tant que
16 politique énergétique et les applications militaires de
17 la technologie nucléaire.

18 Je tiens cependant à dire très clairement
19 que les membres de cette commission sont très
20 conscients de plus vastes préoccupations concernant
21 l'utilisation de matières nucléaires et de
22 l'utilisation de l'énergie atomique pour la production
23 d'électricité.

24 La commission a insisté vivement pour que
25 l'on procède à un examen plus étendu des conséquences



1 environnementales comparées des diverses méthodes de
2 production d'électricité.

3 Des dispositions ont maintenant été prises
4 pour mettre en tel examen en branle. On est en train
5 de consulter les provinces et les groupes intéressés
6 sur le mandat de l'examen qui j'espère, pourrait
7 commencer bientôt.

8 Revenons maintenant à nos réunions. Elles
9 ont pour objet de permettre à ceux qui y participent
10 d'aider la commission à déterminer l'importance des
11 problèmes et des préoccupations qui doivent être
12 étudiés dans l'Etude d'Impact Environnementale qui sera
13 faite par l'AECL.

14 Il ne s'agit donc pas de discuter
15 maintenant du concept de stockage lui-même. Des
16 audiences publiques auront lieu plus tard pour discuter
17 de l'acceptabilité de la proposition faite par
18 l'AECL.

19 Après cette série de réunions actuelle, la
20 commission rédigera une ébauche de directives pour la
21 préparation de l'Etude d'Impact Environnemental.

22 Le public disposera d'au moins trente (30)
23 jours pour faire ses commentaires. Ensuite, après
24 avoir tenu compte de ces commentaires, la Commission
25 rédigera la version finale des directives qu'elle



1 transmettra à l'AECL . Quand l'AECL aura complété son
2 étude d'impact, un travail qui durera une (1) année,
3 peut-être dix-huit (18) mois, même plus.

4 Elle la déposera auprès de la Commission
5 et le document sera mis à la disposition du public pour
6 examen pendant un minimum de quatre-vingt-dix (90)
7 jours.

8 Pour l'aider dans l'évaluation des
9 questions scientifiques et techniques, la Commission a
10 établi un groupe d'examens scientifiques composé
11 d'experts indépendants, éminents, qui examineront la
12 sécurité et l'acceptabilité scientifique du concept de
13 stockage proposé par l'AECL.

14 Ils présenteront à la commission un
15 rapport de leurs conclusions et de leurs
16 recommandations. Ce rapport sera lui aussi, mis à la
17 disposition du public pour que celui-ci puisse
18 l'examiner.

19 Lorsque la commission considérera que
20 l'AECL a traité tous les sujets indiqués dans les
21 directives d'une manière satisfaisante, elle tiendra
22 des audiences publiques.

23 C'est à cette étape de l'examen, que le
24 public sera invité à discuter en détail de
25 l'acceptabilité du concept de stockage de l'AECL.



1 La commission prendra en considération,
2 tous les commentaires qui lui seront présentés et
3 préparera comme son acte final, son rapport au ministre
4 de l'environnement et de l'Energie, Mines et
5 Ressources.

6 Les procédures publiées le 24 août cette
7 année s'appliquent aux réunions de détermination de
8 l'importance. La commission apprécierait que les
9 participants veuillent bien s'en tenir à la
10 détermination des questions comprises dans son mandat.

11 Je prie ceux qui sont inscrits pour faire
12 un exposé de s'efforcer de limiter la présentation à
13 quinze (15) minutes à moins qu'ils n'aient demandé
14 préalablement dix (10) minutes additionnelles.

15 La commission accordera la même attention
16 aux exposés oraux qu'aux exposés écrits. Les
17 participants inscrits seront invités à présenter leurs
18 opinions à la Commission. Après chaque présentation,
19 la Commission peut poser des questions de
20 clarification, et demander des précisions.

21 Tous ceux qui souhaiteraient présenter
22 leur point de vue mais ne sont pas encore inscrits au
23 préalable, peuvent s'adresser au secrétariat de la
24 Commission ou à monsieur Greyell, madame Toller ou
25 madame Flanagan, maintenant ou plus tard dans la



1 soirée. Nous ferons tout notre possible pour
2 satisfaire tous ceux qui veulent nous adresser mais
3 tout dépendra bien sûr du temps dont nous disposerons à
4 la fin de la séance.

5 Les sténographes enregistreront les débats
6 de chaque séances et des procès-verbaux seront
7 disponibles dans les bibliothèques indiquées. On
8 pourra aussi obtenir au Bureau Fédéral d'Examen et
9 d'Evaluation Environnementale à Ottawa, un recueil des
10 mémoires écrits.

11 La Commission acceptera des mémoires
12 écrits au sujet de la détermination de l'importance des
13 problèmes jusqu'à la fin de ce mois, jusqu'au 30
14 novembre 1990.

15 Et avec cette introduction, je vais
16 passer la parole maintenant à notre premier participant
17 qui sera monsieur Gordon Edwards, Canadian Coalition
18 for Nuclear Responsibility, Regroupement pour la
19 Surveillance du Nucléaire. Monsieur Edwards, s'il vous
20 plaît.

21 PRESENTATION BY GORDON EDWARDS:

22 Thank you Mr. Chairman. My name is Gordon
23 Edwards, I'm a mathematician by training, Professor of
24 mathematics and science at Vanier College and President
25 of the Canadian Coalition for Nuclear Responsibility



1 which is in French Regroupement pour la Surveillance du
2 Nucléaire.

3 It's a federally incorporated charitable
4 organization. And I have given to the members of the
5 panel a few documents which I think might be relevant.

6 Unfortunately, I didn't have sufficient
7 copies of the full version of "Nuclear Waste, what me,
8 worry?", but I've made available two (2) copies, that's
9 the bound version.

10 The spiral bound version of "Nuclear
11 Waste, what me, worry?" is incomplete in that it only
12 contains the material which I prepared in 1978 for the
13 House of Common's Committee on natural resources and
14 public works, which at that time, was looking into the
15 Hare Report.

16 It was having hearings on the management
17 of Canada's nuclear waste, commonly known as the Hare
18 Report, published by Energy, Mines and Resources in
19 Ottawa. The fuller version has an update that was
20 written in 1987 and presented by me to the House of
21 Commons Standing Committee on forestry and environment.

22 These concerns are the concerns which the
23 Board of Directors of the Canadian Coalition for
24 Nuclear Responsibility, feel are uppermost, in terms of
25 dealing with nuclear waste.



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1 I would like to begin by saying what I
2 think is important to say, and that is that I and the
3 Board of Directors of the Canadian Coalition for
4 Nuclear Responsibility, are rather distressed by the
5 manner in which this important subject is being
6 treated.

7 In particular, we found it really
8 intolerable that the Government of Canada should be
9 conducting environmental assessment hearings on the
10 concept of geological disposal. Frankly, we're all
11 grappling with the question of what is the
12 environmental impact of a concept. It seems difficult
13 for us, it certainly is difficult for us to understand
14 how you can reform an environmental assessment of a
15 concept in the absence of any site. It seems that the
16 definition of environmental impact is that one should
17 have an environment. And if one does not have an
18 environment, then I don't see how you can do an
19 Environmental Impact.

20 But that's one matter. Another matter is
21 the fact that while these hearings are taking place,
22 the Government of Canada is taking steps to expand the
23 nuclear industry. Taking steps to authorize more
24 nuclear reactors which will be producing more high
25 level, radioactive waste. Now we recently had an



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1 example with the Rafferty Dam situation where a panel
2 of FEARO resigned because they felt themselves in a
3 difficult position, conducting an Environmental
4 Assessment of a project which was under construction at
5 the same time that the Environmental Assessment was
6 taking place.

7 From the point of view of myself and the
8 other members of the board of directors of CCNR, we
9 feel that we are in a similar situation in the nuclear
10 of field. When the minister of Energy, Mines and
11 Resources, who set in motion this process,
12 simultaneously authorizes an extra billion dollars to
13 develop a new nuclear reactor, the Candu 3, over the
14 next seven (7) years and also, gives every indication
15 that such a reactor will be constructed in New
16 Brunswick, one is tempted to ask the question what does
17 this do to the credibility of the FEARO process? Is
18 this... are these hearings to be seen as window
19 dressing or are they to be seen as having a
20 predetermined conclusion.

21 Now there is a context to all of this and
22 it's a context which I'm afraid is -- you'll bear with
23 me, Mr. Chairman, I would like to just elaborate a
24 little on this, because there is a historical context.
25 And that historical context goes back to the document



1 which I mentioned to you at the beginning, that is the
2 Hare Report.

3 The Hare Report was published in 1977 and
4 hearings were begun at the House of Commons
5 Committee level and there were over three hundred (300)
6 briefs submitted to that committee, most of them, as I
7 understand it, quite critical of the conclusions of the
8 Hare Report, one of them in fact from a vice-chairman
9 of Ontario Hydro, Dean Hoffman, of Queens' University.

10 Another one from the Professional
11 Association of Geologists, one of the large
12 professional Association of Geologists in Canada, and
13 numerous other excellent briefs, which were critical of
14 the plan proposed in the Hare Report for geological
15 disposal of nuclear waste in the Canadian shield.

16 At the same time, there was a provincial
17 inquiry under way, which was the Royal Commission on
18 Electric Power Planning. That commission, commonly
19 known as Porter Commission, was also having hearings on
20 the subject of nuclear waste and high level nuclear
21 waste, along with many other aspects, such as nuclear
22 safety, etc, etc.

23 The Government of Canada without waiting
24 for either one of these committees to finish their
25 deliberations, signed an agreement with the Government



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1 of Ontario, to initiate work on essentially
2 implementing the Hare Report's recommendations and that
3 was the 1978 agreement signed by the Energy Minister of
4 Canada, and the Energy Minister of Ontario.

5 If you read the record, Mr. Chairman, and
6 panellists, of the House of Commons Committee, that had
7 been having hearings into that report, you can read of
8 the frustration and anger of the committee members at
9 being so preempted.

10 And in fact, that committee never filed a
11 report because it seemed that the government had simply
12 obliterated the purpose of those hearings with a single
13 stroke.

14 Now, it's those kind of actions, Mr.
15 Chairman, from the past, which leave a bitter taste in
16 terms of due process and in terms of seriously --
17 taking seriously, a deliberative process which was in
18 itself, well conceived and was progressing well until
19 it was superseded. There's a very wide spread fear in
20 the environmental community in Canada, that these
21 hearings may suffer a similar fate. And I would like
22 to emphasize that these concerns in no way reflect upon
23 any member of the panel, or the Chairman of this
24 committee. On the contrary, nor does it reflect on the
25 FEARO process. On the contrary, it is due to our



1 concern for having a good, well respected, highly
2 credible FEARO process, that we raise these concerns.

3 We felt that it is not to the benefit of
4 the FEARO process to be seen, to be perhaps
5 participating in something which is, which is in fact
6 not a genuine deliberation. And that's why I raise
7 these concerns.

8 Let me just recapitulate. The
9 fundamental problem I was trying to raise here, is the
10 fact the Government of Canada is committing funds,
11 money and resources and even seems to be on the verge
12 of making decisions which would in fact lead to the
13 construction of new facilities, producing more high
14 level nuclear waste, before waiting for the conclusions
15 of these hearings.

16 This would be contrary to, at least two
17 (2) important recommendations that have come out in
18 Canada, one at the provincial level and one at the
19 federal level, the Porter Commission, whom I mentioned
20 earlier, in 1978, recommended that it would be
21 justified to have a moratorium on nuclear reactors if
22 suitable progress is not made on this matter of high
23 level waste disposal.

24 And, by 1990 I might add, there is also
25 more recently, an all-party House of Commons Committee,



1 the Committee on Forestry and Environment, which
2 published their report, the Eleventh Hour, also
3 recommending unanimously, Mr. Chairman, that a
4 moratorium on the construction of new facilities
5 producing high level nuclear waste, would be in order
6 until the people of Canada have, the people of Canada,
7 have in fact decided what is the best course of action
8 to take with regard to these nuclear wastes.

9 Now all of this is based upon a very
10 important consideration. And that is that we must not,
11 I think make the mistake of assuming that every problem
12 that humans bring about, is necessarily solvable.

13 Now as a mathematician, I can attest, that
14 for many thousand of years, in mathematics, it was
15 firmly believed that this was the case, that in fact,
16 every problem which made mathematical sense, could be
17 solved.

18 In the 19th century, it was discovered and
19 proved beyond any doubt, that many classical problems
20 dating back to the ancient Greeks, are in fact not only
21 unsolved but unsolvable. They will never be solved.
22 And they have been proved that they are unsolvable. It
23 has been proved mathematically, that they never will be
24 solved because the very nature of the problem precluded
25 the solution. This is a well known fact in the



1 mathematical community now, it was certainly not a well
2 know fact in the 18th century.

3 Perhaps in the physical and engineering
4 sciences, we are just beginning to come up against the
5 limits of our own powers of prediction and control.
6 Perhaps in the physics and engineering sciences and
7 even in the biological sciences, perhaps we may
8 encounter similar types of situations where we have
9 problems which really are not solvable at least not in
10 the terms in which they are posed. And what are the
11 terms in which this particular problem of waste
12 disposal is posed?

13 It is presumed and I say that word
14 advisedly because I think it is very much a
15 presumption, it is a fundamental underlying
16 presumption, that we can continue to produce nuclear
17 waste, high level nuclear waste indefinitely in to the
18 future, without establishing any ceiling on the
19 absolute amount of such waste. And that we will in
20 fact, devise a method for safely storing this material,
21 despite the fact that it is so toxic that all the fresh
22 water in the world is not sufficient to delude it to
23 safe levels as the US Geological Survey has commented
24 in their famous 1978 circular on the subject. This may
25 be folly. It is true that we have waste on hand



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1 already and it is true that we're going to have to do
2 something with it. It is not necessarily true that we
3 can continue producing this stuff indefinitely into the
4 future and expect that it will never come back to haunt
5 us. It may be that the problem perhaps will be
6 solvable if we limit it, but not solvable if we don't
7 limit it. And for this reason, I must object in the
8 strongest possible terms to the terms of reference
9 given to this FEARO panel.

10 I think that it is not possible Mr.
11 Chairman, to give proper scope to an Environmental
12 Impact Statement or to an Environmental Impact Hearing,
13 if the terms of reference themselves are wrong.

14 And the terms of reference, as I read
15 them, perhaps I'm reading them wrongly, but as I read
16 them, the terms of reference preclude consideration of
17 certain things which definitely should be
18 considered. One of them for example being, a
19 discrimination between historical waste which we cannot
20 wish out of existence, and future waste which we can.

21 If we're not allowed to consider
22 historical waste as being in a different category from
23 future wastes, if the panel is not allowed to consider
24 the difference between these two types of nuclear
25 wastes, than I fear that a sensible approach may be



1 precluded.

2 It may be then the case that if the panel
3 were to decide that an acceptable solution existed for
4 waste on hand, that that in effect, gives a green light
5 for the un... unbounded production of such wastes in
6 the future. That is one very strong concern we have
7 about the terms of reference, Mr. Chairman.

8 Another strong concern we have about the
9 terms of reference is the very fragmentary and non-
10 holistic look at radioactive waste.

11 The nuclear technology produces not only
12 high level radioactive waste which is in the form of
13 spent fuel or the derived reprocessed waste from that,
14 but also produces very large quantities of highly
15 dangerous uranium tailings as well as the
16 decommissioning wastes resulting from radioactive
17 dismantling of the structures of the nuclear reactors
18 at the end of their lifetime.

19 Now, Mr. Chairman, I have read carefully
20 the documentation and also speeches made by Atomic
21 Energy of Canada Limited representatives, and it is
22 clear to me, that one of their arguments, which they
23 frequently make in public and which they will probably
24 make to this board, to this panel, is that the high
25 level waste, after a thousand years or so, is not



1 significantly more hazardous than radioactive ore
2 bodies or the tailings derived from such ore bodies.

3 Now, Mr. Chairman, I believe this to be
4 true. But I also believe it to be true, that the
5 tailings derived from those ore bodies are a monumental
6 problem. And I don't see how this Committee, how this
7 panel, will be in a position to judge or weigh such
8 arguments or such representations, if they are not
9 allowed to in fact, investigate the toxicity of the
10 uranium tailings, the mistakes which have been made
11 with trying to deal with uranium tailings, the
12 underestimates and false assumptions that have been
13 documented in dealing with uranium tailings.

14 It seems to be that the panel will find
15 itself unable to judge the validity of such
16 comparisons. And for this reason, I would urge, Mr.
17 Chairman, that the panel ask for better and more
18 complete terms of reference because I think that
19 without such terms of reference, it will not be
20 possible to do a proper job.

21 I'd now like to turn to the particular --
22 let's say the nitty gritty of the problem which is at
23 hand, and that is the question of assessing a concept
24 of geological disposal.

25 I have made available to the secretary two



1 (2) copies of this report, which is from the California
2 Energy Resources Conservation and Development
3 Commission, dated January 11th, 1978. It's called
4 "Status of Nuclear Fuel Reprocessing, Spent Fuel
5 Storage and High Level Waste Disposal".

6 Now, just briefly Mr. Chairman, may I tell
7 you the context of this report. This report is simply
8 a summary and overview of a very, very large
9 undertaking by the California government.

10 The California legislature passed three
11 (3) laws which essentially made it illegal to license
12 nuclear reactors in California until or unless, at
13 least one (1) safe method for disposal of high level
14 radioactive waste was available.

15 The body which was given the job of seeing
16 whether such was the case, was the California Energy
17 Resources Conservation and Development Commission.

18 And in order to fulfil their mandate to
19 advise the legislature as to whether or not there was
20 such a method for handling high level radioactive
21 waste, this body, which by the way is the body which,
22 as I understand it, gave a state license for nuclear
23 reactors and for other facilities in the States and is
24 quite, quite a large and well funded body -- this body
25 undertook to have extensive hearings with many



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1 thousands of pages of testimony and hundreds of
2 witnesses appearing before them, whom they summoned, to
3 inquiry about the feasibility of geological disposal of
4 high level radioactive wastes.

5 And I think that the results of the study
6 would be of interest to the panel members. And in
7 fact, the entire multi-volume documentation from this
8 effort, would be of value to the panel members if they
9 could acquire them.

10 What the upshot was, was that they
11 concluded that there is in fact at present, no method
12 for safely handling these wastes into the indefinite
13 future.

14 And they raised the question as to whether
15 in fact, there would be -- and if you read the wording
16 of the document, you will see that they cite five (5)
17 failures to date, that is at the date of writing, five
18 (5) failed attempts in the United States, to actually
19 implement a geological disposal option for high level
20 nuclear waste, all of which failed not only because of
21 political problems, but more importantly, because the
22 fundamental technical and scientific problems, which
23 came to light...

24 I could, I think it's very illustrative to
25 take a look at some examples of those technical and



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1 scientific problems because although they were looking
2 at a different medium which is bedded salt as a
3 disposal option, they were trying to put the waste into
4 salt formations, Mr. Chairman, and these salt
5 formations were considerable desirable because of their
6 self-healing proprieties. The fact that they are a
7 soft rock and that basically, if there are fractures,
8 those fractures will heal and consequently limit the
9 pathways to the environment.

10 There are also other considerations such
11 as the thermo conductivity of salt. Salt is a good
12 conductor of heat and consequently, since the wastes
13 will be generating heat for a very long time, the salt
14 would help to dissipate that heat rather quickly.

15 Both of these advantages I might add are
16 not shared by granite, which is what we are looking at
17 here in Canada. Granite is a very brittle substances
18 easily fractured and in fact, unfractured granite is
19 very difficult to find.

20 Sinking a shaft does cause fractures and
21 once you have excavated chambers in granite, you can
22 expect further fracturing in the years that follow and
23 the decades and the centuries that follow, as a result
24 of the permanent disturbance and the stress field that
25 has been created by the excavation itself.



1 Moreover, granite is not a particularly
2 good heat conductor and consequently, the local heat
3 build up will be greater in granite than in salt.

4 Be that as it may, the choice of salt was
5 also dictated by one very important consideration, and
6 that was the absence they thought of water.

7 The fact that these salt formations had
8 existed for such a long time argued that they had not
9 been subject to water for an equally long time
10 otherwise they would have dissolved.

11 Well, as the record shows, they discovered
12 that they were wrong. In fact, in one case, they
13 drilled into a salt formation and actually struck a
14 pocket of pressurized brine which surprised them.

15 They now know, but they didn't know at the
16 time, they now know that every salt formation does have
17 pocket of brine and they have also learned that the
18 very heat of the waste caused those brine pockets to
19 migrate towards the waste.

20 The reason being that the pocket, the side
21 of the brine pocket which is closest to the waste
22 becomes slightly warmer than the side away from the
23 waste and this causes a higher solubility and that
24 causes a gradual migration. And et cetera.

25 Now, my point in making this comparison



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1 Mr. Chairman, is simply to point out that we have not
2 been looking at granite very long.

3 Granite is a commercially unattractive
4 substance. As a result, our ignorance of granite
5 surpasses our ignorance of most other rock formations.

6 And in fact, much of the interest of a
7 geological and scientific nature which accrues to the
8 work done at Whiteshell, Pinewa rather, excuse me, I
9 mean Lac Dubonnet, which the underground research
10 laboratory of Atomic Energy of Canada Limited, is
11 precisely because relatively little is known about
12 granite and this is the first major opportunity to do
13 fundamental scientific research in granite.

14 I am rather appalled that this panel and
15 the Canadian public apparently, are being asked to
16 judge a concept which has so little scientific research
17 behind it to date.

18 It's surprising to me from everything that
19 I've been able to determine, it seems to me that Atomic
20 Energy of Canada Limited, could not have performed very
21 many long term experiments because they haven't really
22 had the laboratory for very long and I'm very surprised
23 that in the absence of long term data, that they would
24 even be asking the panel to consider the approval or
25 disapproval of this concept.



1 There's a couple of things which I would
2 like to touch on particularly. I don't know how my
3 time is Mr. Chairman, but I think it's running out.

4 THE CHAIRMAN: You asked for an additional
5 ten (10). You're close to that twenty-five (25) mister
6 Edwards.

7 MR. GORDON EDWARDS: I'm close to the
8 twenty-five (25).

9 THE CHAIRMAN: You're within a couple of
10 minutes of it.

11 MR. GORDON EDWARDS: Alright, let me just
12 point out a couple of major -- I haven't even begun to
13 really get into the technical details but let me just
14 point out a couple of major areas where I think that
15 AECL should be required to provide a lot of detailed
16 information.

17 First is reprocessing. And again, I think
18 it's intolerable that the terms of reference preclude
19 the committee from looking into the full environmental
20 impact of reprocessing when the panel is going to be
21 asked to judge the merits of burying reprocessed waste.

22 It seems to me that one has to look at the
23 environmental impact of reprocessing per se.

24 Reprocessing, Mr. Chairman, is a very
25 dirty operation involving the robotic chopping up of



1 the fuel elements, dissolving them and boiling nitric
2 acid, occasioning the release of gaseous radio nuclide
3 emissions as well as very large volumes of highly
4 acidic and caustic... excuse me, highly acidic high
5 level radioactive liquid wastes, which also occasions
6 contaminated bulky equipment that must be treated as
7 high level radioactive waste.

8 And moreover, there are additional
9 problems accruing not only to the toxicity of the
10 plutonium, which would be separated from the spent
11 fuel, from the products, but there are also concerns
12 about possible theft of plutonium, possible terrorists
13 attacks to obtain plutonium from a reprocessing plant
14 all of which has a direct bearing on the ultimate
15 safety, the ultimate environmental safety of such a
16 plant.

17 Now, as I read the terms of reference,
18 anything of a military nature, that presumably, that
19 means anything having to do with bombs, is not within
20 the terms of reference of the panel.

21 However, I don't see how you can talk
22 realistically about the hazards associated with
23 reprocessing, even the environmental hazards associated
24 with reprocessing if you do not talk about the fact
25 that plutonium is not only a potential fuel, but also a



1 potential element for bombs.

2 And consequently, a potential target for
3 criminal activities, activities of criminal
4 organizations, terrorists organizations, whatever, to
5 try to acquire such plutonium. And that is, that is I
6 think, a major concern.

7 I would hope that the panel would require
8 of Atomic Energy of Canada Limited, detailed informa-
9 tion as to the toxicity of all of the emissions that
10 would be occasioned by reprocessing, the effluent
11 control and what kind of guarantees Atomic Energy of
12 Canada Limited has that they will be able to actually
13 contain these effluents and keep them out of the
14 environment.

15 Because, certainly the tract record at
16 other reprocessing plants in other parts of the world,
17 is not sterling.

18 There is one other concern which I think
19 should be raised and that is the following. In
20 assessing the concept of geological disposal, one has
21 to ask two (2) things: what is the criterion for doing
22 this?

23 That is first of all, why do you want to
24 do it? What are you hoping to achieve? And
25 the second thing is how are you to judge its success?



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1 Obviously, you can put waste underground.
2 But if it has been there for fifty (50) years, does
3 that mean it's going to be there safely for five
4 hundred thousand (500 000) years?

5 If it has been there even safety for a
6 century, does that mean it's going to be there safely
7 for a thousand (1 000) years.

8 What possible scientific criterion can you
9 use to judge whether or not your disposal scheme has
10 been successful?

11 In fact, that was one of the principal
12 points which lead the California Energy Resources
13 Commission, to decide that no method exists and no
14 method may exist if this problem of finding the proper
15 criteria and verifying those criteria cannot be solved.

16 The other aspect of this is why do we want
17 to put it underground? Why should we put it
18 underground rather than for example, leaving it above
19 ground in monitored storage as it is at present?

20 The argument that Atomic Energy of Canada
21 Limited has given in public in the past, is that we
22 want to put it underground in order to basically lift
23 the burden from future generations so that they will
24 not have the burden of having to look after our wastes.

25 Again the California Energy Commission



1 decides that in the absence of criteria, putting it
2 underground does nothing to alleviate that burden
3 because, if we cannot prove within a finite time
4 horizon, that it is safe for the indefinite future,
5 then the necessity of perpetual surveillance remains.

6 Moreover, if you have a growing atomic
7 energy -- a growing use of nuclear power, suppose the
8 growth of nuclear power grows at any percentage point
9 you wish, suppose you have a growth of 3% even in
10 nuclear power per year.

11 We know that the wastes have to wait ten
12 (10) years before they are put underground at a
13 minimum. That's because of the heat generation.
14 Atomic Energy of Canada Limited admits that there has
15 to be a waiting time of a decade or so before you even
16 consider putting them underground.

17 Because of that time lag Mr. Chairman, if
18 you are expanding the use of nuclear power by any
19 percentage, then, there will be a constantly
20 accelerating gap between the wastes which are being
21 produced and the wastes which are being put
22 underground. Even if you're putting them underground
23 as fast as possible.

24 So that in fact, you will never have less
25 nuclear wastes on the surface of the earth than you



1 have today. Each year you will have more.

2 THE CHAIRMAN: Mr. Edwards, I'm sorry to
3 have to interrupt you but you really are to thirty (30)
4 minutes now and...

5 MR. GORDON EDWARDS: Okay, fine.

6 THE CHAIRMAN: ...consideration for the
7 others and there are several who want to address us
8 this evening.

9 MR. GORDON EDWARDS: Okay.

10 THE CHAIRMAN: I think, I must ask you if
11 you would...

12 MR. GORDON EDWARDS: May I ask a
13 procedural question. Is it possible to submit in
14 writing, some questions which should be put to Atomic
15 Energy of Canada Limited, with regard to the
16 Environmental Impact Statement?

17 THE CHAIRMAN: It is not only possible, we
18 would strongly encourage it.

19 MR. GORDON EDWARDS: Okay.

20 THE CHAIRMAN: We would be very grateful
21 if you could -- we would like to have that by the end
22 of the month if you could put something down and get it
23 to us.

24 MR. GORDON EDWARDS: Okay.

25 THE CHAIRMAN: Now, those are the written



1 submissions I referred to in my opening comments, we'd
2 be very pleased to receive them from you.

3 MR. GORDON EDWARDS: Right and again,
4 without meaning any discourtesy to the panel or to
5 yourself Mr. Chairman, I would like to repeat once more
6 that if the terms of reference are not somehow
7 expanded, or if the apparent conflict between expanding
8 the industry and having these hearings is not resolve,
9 then, I'm afraid that many groups in Canada are going
10 to come to the conclusion that these hearings are
11 without any intention on the part of the panel, perhaps
12 a sham. Thank you.

13 THE CHAIRMAN: Could you wait a moment
14 please, Mr. Edwards...

15 MR. GORDON EDWARDS: Oh, sorry.

16 THE CHAIRMAN: ...in case there are any
17 points of clarification or...

18 MR. GORDON EDWARDS: Certainly.

19 THE CHAIRMAN: ...precision which members
20 of the panel would like to put to you. Any panel
21 members wish.... yes, Dr. Wilson?

22 DR. LOIS WILSON: You mentioned that you
23 thought it was a very short time frame that AECL had
24 been doing research into granite.

25 MR. GORDON EDWARDS: Yes.



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1 DR. LOIS WILSON: It may be an answered
2 question but do you have any suggestions as to what
3 time frame would be more adequate and any basis for
4 suggesting that time frame?

5 MR. GORDON EDWARDS: Well, I'm guided
6 partly by the US Geological Survey Circular because I
7 am not a geologist. But I was very impressed by both
8 the... not this report but there are much thicker
9 reports available from the California Energy
10 Commission, which really identify literally dozens if
11 not hundreds of unanswered questions of basic science.

12 Now the US Geological Survey circular
13 which I referred to, I believe it's circular 779, on
14 the geological aspects of high level waste disposal
15 also identify many fundamentally unanswered questions
16 of a scientific nature which would have to be resolved,
17 in order to determine whether or not geological
18 disposal in granite or other media, would be safe for
19 the long term.

20 I'm really astonished that just ten (10)
21 years later or twelve years later, that Atomic Energy
22 of Canada Limited, comes to the Government of Canada,
23 apparently with the idea that it has resolved all these
24 difficulties and is ready to undergo an Environmental
25 Assessment.



1 I just find it astounding that so many
2 fundamental scientific questions could be answered in
3 so short a time.

4 I do not know how long it would take, but
5 one question I ask it, what's the rush, particularly
6 when the most damaging wastes in Canada at the present
7 time, are not the high level wastes, which are not
8 getting into the environment, even though they're
9 potentially dangerous, but they are the uranium
10 tailings.

11 The uranium tailings are getting into the
12 environment, they're getting into our watershed,
13 they're getting into our food chain and seems to me,
14 that anybody with an ounce of common sense would say
15 that that should be the priority in terms of nuclear
16 wastes.

17 So I find it strange that there is this
18 urgency to solve a problem which is not immediately a
19 problem.

20 DR. LOIS WILSON: Thanks.

21 THE CHAIRMAN: Any other members of the
22 panel have any questions to put to Mr. Edwards? We
23 thank you for your, not only for your presentation,
24 oral presentation, but thank you also presumably for
25 your written material which we will have a chance to



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1 look at in the next few weeks, certainly as we get down
2 to the next stage of our work.

3 And we will certainly look forward to
4 receiving from you some of the written questions which
5 you think ought to be addressed...

6 MR. GORDON EDWARDS: Thank you.

7 THE CHAIRMAN: It's precisely that sort of
8 thing which we need for - at this stage of the at this
9 stage of our work to make sure that we have identified
10 all the questions to which answers ought to be
11 provided.

12 MR. GORDON EDWARDS: Right, may I beg your
13 indulgence for just one final statement. It has to do
14 with one of the hand outs you have. It's really a
15 reprint of an article from the Globe and Mail about a
16 serious accident at the Bruce Nuclear Generating
17 Station due to a computer error.

18 I just wanted to mention that my reason
19 for including that Mr. Chairman, is that ultimately,
20 the only proof as I understand it that Atomic Energy of
21 Canada Limited could offer to support their claims of
22 safety for geological disposal, are essentially
23 mathematical.

24 That they're going to be using
25 mathematical models for this. And as a mathematician,



1 I would like to underscore the message of that article
2 which is computer models are pesky and they're
3 particularly pesky if you dare to believe them. One
4 has to remember that although computers are very
5 powerful and succeed at many things, and although
6 science is very powerful and succeeds at many things,
7 in terms of waste disposal, it's not the success that's
8 important, it's the failure.

9 And we have to then put on our caps and
10 think about -- in other fields when we have failures,
11 we just forget about them and say well look at the
12 successes but in the field of waste disposal, we can't
13 afford to overlook those failures. And I'm afraid that
14 at the present time, we have no mathematical or
15 scientific basis for knowing that a computer program is
16 correct. Thank you.

17 THE CHAIRMAN: Thank you Mr. Edwards.

18 ---Mr. Edwards withdraws.

19 THE CHAIRMAN: Could I call next on Mr.
20 Andrew Orkin who will be speaking on behalf of the
21 Lawyers for Social Responsibility.

22 PRESENTATION BY MR. ANDREW ORKIN:

23 Good evening members of the panel and Mr.
24 Chairman. My name is Andrew Orkin. I'm National
25 Vice-President of Lawyers for Social Responsibility



1 Canada, a not for profit organization of members of the
2 legal profession and also Director of it's Quebec
3 Chapter, Juristes pour la Paix et la Sécurité. I thank
4 the panel for this opportunity to participate in this
5 evening's proceedings.

6 Our organization was founded in 1983 in
7 response to the threats posed by nuclear weapons to the
8 survival of the planet.

9 In spite of the traditional reticence of
10 the legal profession on issues such as this one, our
11 organization grew quickly to a membership of over eight
12 hundred (800) members of the legal profession and has
13 chapters in sixteen (16) Canadian centres.

14 The Quebec Chapter, Juristes pour La Paix
15 et la Sécurité, has over a hundred (100+) members. As
16 lawyers, we're not experts in the technical aspects of
17 either producing, storing or disposing of nuclear
18 wastes.

19 Neither are we experts on the effect of
20 radioactive and toxic materials on the flora and fauna
21 of this planet. And we're certainly not experts on the
22 composition and stability of Canadian Geological
23 Formations or their suitability for the task as AECL
24 proposes, of receiving high level nuclear waste.

25 We are however specialist in procedure and



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1 processes of public participation. We're called upon
2 daily to evaluation and challenge when needs be the
3 processes and practices of governments and other
4 institutions where these may affect individuals and the
5 communities that they form.

6 It's therefore the responsibility of
7 lawyers to assist them in exercising their democratic
8 right, intervene effectively in decisions that will
9 profoundly affect them for generations to come.

10 We're also concerned, and this bears
11 noting, that Canada's environmental assessment regime
12 criticized and much maligned as it often is, is
13 something that we have to be proud of and that needs to
14 be strengthened and protected.

15 Lawyers for Social Responsibility has a
16 number of concerns relating to processes and
17 determination of the scope and content of this
18 Environmental Review Process that we feel obliged to
19 raise at this early stage, that is at the first round
20 of public consultations on this panel's work.

21 In my organization, we've consulted with
22 confrères presenting substantive comment on the scoping
23 of this environmental assessment and we're confident
24 that our concerns have been and are being adequately
25 raised at this hearing in Montreal and at other



1 hearings in centres elsewhere.

2 I therefore wish to beg the indulgence of
3 the panel and comment mainly this evening on process
4 and procedures and the terms of reference that will
5 determine this panel's work.

6 Mr. Chairman, if this is in order, may I
7 continue.

8 THE CHAIRMAN: Yes.

9 MR. ANDREW ORKIN: Thank you.

10 An inevitable consequence of embarking on
11 a process of research, education and advocacy on the
12 issues of nuclear war was for Lawyers for Social
13 Responsibility to discover that nuclear weapons of mass
14 destruction are part of the complex globally integrated
15 nuclear fuel cycle.

16 The reason we're here this evening is that
17 Canada as the world's largest miner, miller, refiner
18 and producer of uranium, is therefore also a major
19 participant in this nuclear fuel cycle.

20 Inevitably therefore Canada is also a
21 world class producer of hundreds of millions of tons of
22 low and high level nuclear waste.

23 In the seven (7) years of its existence,
24 Lawyers for Social Responsibility has thus, we feel,
25 logically, turned its attention to the nuclear fuel



1 cycle as an integrated whole.

2 At our annual conference in Vancouver in
3 1989, after some years of deliberation, the following
4 resolution was passed and I'll give it to the
5 Commission... to the panel in full but I'd like to read
6 portions of this into the record if I may.

7 "Whereas Canada is the world's largest
8 miner and producer of uranium for nuclear
9 fission... accounting for more than 30% of
10 the world's supply of fissionable uranium,
11 Whereas the mining, milling and refining
12 of uranium has produced and will produce
13 vast quantities of radioactive waste that
14 will remain hazardous to all life for
15 thousands of years, and must be isolated
16 from the environment effectively forever.
17 Whereas Atomic Energy of Canada Limited
18 continues to promote the sale and
19 installation of nuclear technology
20 including Candu and Slow Poke reactors at
21 home at abroad.
22 Whereas these technologies produce large
23 quantities of high level radioactive waste
24 including the reactors themselves at the
25 end of lives measured in mere tens of



1 years, which must be isolated from the
2 environment effectively forever.

3 Whereas there is no demonstrated method of
4 safely and reliably disposing of low of
5 high level nuclear waste and it appears,
6 will not be for the foreseeable future.

7 Whereas much of Canada's uranium, mining
8 development and concomitant creation of
9 nuclear waste occurs on or is proposed for
10 aboriginal territory, where native peoples
11 will suffer the consequences to their
12 land, traditional lifestyles and human
13 rights caused by this activity, without
14 having consented to them and with minimal
15 or no benefit.

16 Now therefore, Lawyers for Social
17 Responsibility calls upon the Federal
18 Government of Canada to immediately impose
19 a moratorium on the further development of
20 all aspects of the Canadian nuclear
21 industry, including mining, milling,
22 refining, import and export of uranium and
23 other fissionable materials and on the
24 further development and implementation of
25 nuclear technologies, excluding essential



1 medical uses.

2 We further call on the Federal and
3 provincial governments to undertake a
4 national process of inquiry into and
5 debate on all aspects of the Canadian
6 nuclear industry, including questions of
7 end use and environmental, health, social,
8 economic and other aspects.

9 We further call on the federal government
10 to immediately strengthen the regulatory
11 regime applicable to the Canadian nuclear
12 industry, to insure a safe and healthy
13 environment for the Canadian people now
14 and for all future generations to come."

15 Lawyers for Social Responsibilities call
16 for a moratorium on the further use, development or
17 expansion of nuclear industry in Canada, pending a full
18 public discussion of all of its aspects, is not a
19 radical or an original idea.

20 With respect to high level waste in
21 particular, this was the conclusion of the British
22 Royal Commission on Environmental Pollution in 1976,
23 which recommended that it would be irresponsible and
24 morally wrong, to commit future generations to the
25 consequences of fission power on a massive scale until



1 it has been demonstrated beyond reasonable doubt, that
2 at least one (1) method exists for the safe isolation
3 of these nuclear wastes for the indefinite future.

4 This caution has been repeated by a number
5 of other commissions and bodies, including the US
6 President Advisory Council on environmental quality in
7 1977.

8 The California Energy Commission in 1978,
9 Canada's Porter Commission, the House of Commons
10 Eleventh Hour Report of the Committee on Forestry and
11 Environment, and the British Columbia Medical
12 Association.

13 Existing wastes, many of which are the
14 legacy of decades of ignorance and secrecy, are the
15 unavoidable responsibility of all Canadians.

16 But to continue the production of ever
17 increasing quantities of high level and lower level
18 nuclear waste, while the issue of its safe management
19 remains in the theoretical realm, is in the view of
20 Lawyers for Social Responsibility, unacceptable.

21 To do so is to commit the Canadian people
22 to the multiplication of the dilemma which this panel
23 by its very existence proclaims. We do not yet have a
24 solution, or the consent of the Canadian people to any
25 solution.



1 In legal terms, this is to compound and
2 entrench a prejudice prior to and during discussion
3 about that prejudice and its resolution.

4 In ethical terms, this weakens any attempt
5 at obtaining the consent of the Canadian people to a
6 profound hazard and its management that will affect
7 generations to come.

8 In another context, that of the Rafferty
9 Almeda dam project, a Federal Environmental Assessment
10 Panel quit recently, because the work that was the
11 subject matter of its review, was proceeding in spite
12 of that review.

13 Lawyers for Social Responsibility is
14 concerned that the daily continued production of
15 nuclear waste, radioactive Currie by radioactive
16 Currie, and toxic ton by toxic ton, while only
17 beginning to discuss its possible management, is
18 ethically and legally unacceptable.

19 We repeat our urgent call for a moratorium
20 on all aspects of the Canadian nuclear fuel cycle and
21 call on this panel to do so too, or join its principal
22 Rafferty Almeda colleagues, in resigning until a such a
23 moratorium is declared.

24 We're engaged in a process that will have
25 an impact on future generations to come. The efficient



1 functioning of this panel is an essential and "lawable"
2 goal.

3 The imposition however of unrealistic
4 deadlines for such... for example, such as the mid-
5 summer deadline for submissions of funding applications
6 for these scoping hearings, was unacceptable. The
7 results of this panel's work will be judge we feel, in
8 part at least, on the quality of public participation.

9 A number of organizations of which we're
10 aware, have already been impacted by some of this
11 assessment's procedures and deadlines and their
12 protests appear to have been received but ignored.

13 If the possible future claim that an
14 environmentally and socio-economically acceptable or
15 sound method of disposal has been found for high
16 nuclear waste, is to have any credibility whatsoever?
17 It is the view of Lawyers for Social Responsibility
18 that the job cannot and should not be rushed and that
19 the constraints of concerned Canadians who are not on a
20 nuclear industry of FEARO payroll, must be genuinely
21 addressed.

22 In the same vein but as to funding, more
23 than half a billion tax dollars have been spent over
24 more than a decade in research on this particular
25 proposal. Little more than five hundred thousand



1 dollars (\$ 500,000.00) and that's approximately .01% of
2 that amount will be made available for public
3 participation in a substantive evaluation of this
4 proposal.

5 With all respect, it is the view of
6 Lawyers for Social Responsibility that funding at this
7 level cannot serve to achieve the democratic objectives
8 of full public participation.

9 Recent surveys have shown that the
10 Canadian public relies on and trust public interest
11 groups more than any other sector for environmental
12 information and effective advocacy on behalf of the
13 environment and human safety and security.

14 This scepticism is unfortunately in our
15 view, not without some justification. In the age of
16 Three Mile Island, Saint-Basile le Grand and
17 Hagersville. What quantity and quality of
18 intervention can the tiny amount of public interest
19 funding made available on this task be expected to
20 generate.

21 This panel's procedure in the views of
22 Lawyers for Social Responsibility must "maximumly"
23 honour the spirit rather than pay minimal lip service
24 to public participation otherwise the consent of the
25 Canadian population to this momentous proposal cannot



1 and will not have been obtained.

2 Lawyers for Social Responsibility is of
3 the view that these terms of reference are wholly
4 unacceptable for this important task.

5 Firstly, we wish to record our objection
6 to their preparation without the effective input of all
7 organizations and individuals concerned with this
8 process.

9 Our substantive objections to the terms of
10 reference, which I will elaborate briefly upon in a
11 moment, leads us to the conclusion that the terms of
12 reference amount to an attempt to fetter, not to
13 facilitate, full environmental review, to predetermine
14 an outcome favourable to the proponent, and one that
15 would exclude discussion that might increase public
16 scrutiny of the Canadian nuclear fuel cycle.

17 It is clear to us as lawyers that any
18 government or person who unilaterally drafts terms of
19 reference can, by limiting the scope and content of an
20 inquiry, severely bias its outcome. It's our view that
21 this is the case and we wish to publicly state our
22 disquiet and our reasons for it.

23 The terms of reference of this high level
24 waste disposal proposal require the panel the assess
25 the proposal only in terms of a generic site and state



1 that no site selection for a permanent disposal
2 facility will be undertaken until the concept has
3 undergone public review and been accepted by the
4 governments of Ontario and Canada.

5 To quote: "Since site selection will not
6 take place until a disposal concept has been accepted
7 as safe, the panel shall not consider any specific
8 potential sites."

9 This apparently benign provision could at
10 first blush, seem protective in intent. Why submit a
11 particular community or the panel for that matter, to
12 the work rigor and stress of reviewing or being
13 reviewed as a particular site or sites, before the
14 concept has been found to be safe.

15 This is the first public review of high
16 level nuclear waste disposal in Canada. This is not to
17 say however, that we have absolutely no idea as to what
18 is likely to happen when a proposal to site a high
19 level nuclear waste repository is made in a particular
20 community or area.

21 At least if on a geological basis, on a
22 social -- if not on a geological basis, on a
23 socio-political one. In 1985, the US Department of
24 Energy abandoned its most recent proposal, to site such
25 a facility in Vermont, near to the Quebec border. Like



1 a number of proposals before it, in Main, New
2 Hampshire, Tennessee, Kentucky, Wisconsin and
3 Minnesota, a vast indication of public disapproval,
4 which included in this most recent case, the voices of
5 Quebec and the Federal governments and the Eastern
6 Townships communities closest to the proposed site,
7 forced the Department of Energy to abandon this
8 proposal.

9 Members of Lawyers for Social
10 Responsibility in the Eastern Townships were
11 prominently involved in criticizing that proposal on
12 legal and other grounds.

13 Atomic Energy of Canada's efforts to
14 undertake high level wastes disposal research in
15 Northern Ontario, in the late 1970's was similarly
16 rebuffed by the citizens of that region.

17 It must also be noted that the Government
18 of Quebec, is refusing to participate in this
19 Environmental Assessment, because it says, it refuses
20 to allow disposal of nuclear waste on Quebec soil.

21 Hence we feel, the concept of generic site
22 review. In our view, this is cynical and dangerous
23 manipulation of the Environmental Review Process.

24 First, to isolate environmental review of
25 the proposal to dispose of nuclear waste in the



1 Canadian shield, is to remove the technical and
2 scientific inquiry from the specific environment in
3 which it is to occur.

4 But secondly and more importantly we feel
5 as lawyers and as citizens, it is an attempt to isolate
6 the process of obtaining a technical green light for
7 nuclear waste disposal from the population slated to
8 receive that proposal.

9 In our knowledge of the likely reaction of
10 any particular community to such a proposal, this is an
11 attempt to sidestep a fundamental component of
12 Environmental Review, and that is the informed,
13 motivated and possibly alarmed participation of that
14 community or communities for which generations to come,
15 will be closest to the results of this panel's
16 deliberations.

17 Environmental Assessment and Review
18 Process guidelines with which I'm sure you're very
19 aware, provide in section 3, subsection 2,:

20 "subject to the approval of the minister
21 and the minister of the initiating
22 department, consideration of a proposal
23 may include such matters as the general
24 socio-economic effects of the proposal."
25 In addition other government departments



1 with specialist knowledge, are mandated in section 19
2 of the same guidelines,

3 "to provide information with respect to
4 the social impact of a proposal and to
5 advocate for the protection of those
6 interests."

7 It should be noted that very recent Court
8 rulings have held that these guidelines have to a
9 significant degree, force of law.

10 Lawyers for Social Responsibility submits
11 that the assessment of the socio-economic and social
12 impacts of the siting of a high level nuclear waste
13 disposal facility, cannot be considered or assessed
14 without the involvement of a specific population of
15 affected individuals.

16 To do otherwise is to undertake a process
17 that in spite of the involvement of any number of
18 socio-economic and social experts, is purely
19 technocratic and technical and not an environmental
20 assessment in the full sense, considered and mandated
21 by the statutory order.

22 More importantly, to do otherwise, we
23 fear, could be an attempt to manufacture a document
24 that can at some future stage, be held to the noses of
25 the selected community who could then be told: "The



1 Environmental Assessment has been done, the proposal is
2 safe." and who's anticipated objections could thus be
3 sidestepped, ignored or even prevented.

4 Is it possible that a selected site might
5 one day be on native land. Are the social, cultural,
6 spiritual and environmental impacts of such a
7 possibility to be considered hypothetically without
8 reference to the people of an affected nation.

9 We submit that the dilution of public
10 input inherent in this aspect of the terms of reference
11 is a travesty of the Environmental Review Process that
12 Canadians of present and future generations are
13 entitled to.

14 The terms of reference specifically
15 exclude intermediate and low level radioactive waste
16 such as components of decommissioned nuclear reactors
17 or uranium tailings.

18 It is our understanding that for each unit
19 by volume or weight of nuclear fuel waste, there are
20 many thousand of units of intermediate and low level
21 wastes that require isolation for similarly lengthy
22 time frames.

23 We're concerned that by this exclusion,
24 the nuclear industry may be permitted to address the
25 single aspect of Canada's nuclear wastes dilemma, in



1 spite of its magnitude, that is arguably not the most
2 significant or pressing.

3 The terms of reference specifically
4 exclude "the energy policies of Canada and the
5 provinces and the role of nuclear energy within these
6 policies."

7 It is quite conceivable that the
8 electrical energy produced by present and future
9 nuclear waste that is the subject of this inquiry,
10 could be generated by conservation alone or a
11 combination of conservation and other technologies that
12 will not entail the further production of nuclear
13 waste.

14 Lawyers for Social Responsibility are
15 concerned that the exclusion of discussion in this
16 environmental review of the necessity of producing
17 nuclear waste in the first place, is a further travesty
18 of full and open and holistic environmental review.

19 Finally, the terms of reference exclude
20 fuel processing as an energy policy. We are concerned
21 that any discussion of the option of centralizing
22 Canada's nuclear high level nuclear wastes in one
23 location, without a discussion of the environmental and
24 social impacts of fuel reprocessing as an energy
25 policy, is to partially mislead or not fully inform the



1 Canadian public about the full intentions and whole
2 agenda of the proponent in this regard.

3 Indeed the terms of reference themselves
4 of your panel, define nuclear fuel waste as and I quote
5 "solid fuel bundles discharged from Candu
6 reactors or derived high level nuclear
7 wastes should the used fuel ever be
8 reprocessed at some future date."

9 Lawyers for Social Responsibility is
10 concerned at the deliberate exclusion of discussion of
11 reprocessing policy, is to possibly mislead even a
12 hypothetical generic wastes site community, into
13 believing that it is not extremely likely also to be
14 home, to a plutonium extraction plant and a fuel
15 reprocessing plant.

16 If this is possibly the case, this is a
17 very significant potential environmental impact of the
18 proposal and should be open for discussion at this
19 time.

20 Lawyers for Social Responsibility as I've
21 outlined in my brief presentation, has analyzed the
22 terms of reference, and we feel that to proceed
23 headlong into this Environmental Assessment, as we
24 fully intend to do over the coming months, without
25 recording our concerns in this regard, would be



1 unacceptable to our mandate.

2 I thank the panel for its attention and
3 I'd welcome any questions.

4 THE CHAIRMAN: Thank you Mr. Orkin. May I
5 ask my colleagues on the panel if they have any
6 questions they would like to put to this participant at
7 our hearings? Mr. Van Vliet?

8 MR. PIETER VAN VLIET: Mr. Orkin, you made
9 a statement to the effect that it was ethically as well
10 as legally wrong to continue with nuclear activities in
11 Canada. Are there specific laws in Canada you can
12 refer to that make you make that statement?

13 MR. ANDREW ORKIN: Well...

14 MR. PIETER VAN VLIET: What is well within
15 its assessment?

16 MR. ANDREW ORKIN: One of the jokes that
17 are always made by lawyers is that you'll never get a
18 black and white answer, that you'll always get a grey
19 one and I'm afraid I'm going to give you just that.

20 The feeling that I and other colleagues
21 have and I'm in no position in this forum to give a
22 legal opinion, this would be something you'd have to go
23 to Counsel of the Federal Government or of the FEARO
24 office in particular for, is that the avenue of
25 environmental review as recently opened up in the



1 Rafferty Almeda case deserves reference and much
2 consideration at this point in time.

3 Few of my colleagues would have hazarded a
4 guess that the so-called environmental review
5 guidelines would be given the force of law that they
6 were in that case.

7 And I think that this is an arena given
8 burgeoning public concern about the environment, that
9 the Courts are going to be paying increasing attention
10 to, is whether or not mere guidelines about full and
11 informed and holistic environmental review of a given
12 proposal or merely guidelines may no longer be the
13 case.

14 And it is my hope that it won't be solely
15 in the arena of judicial review of the environmental
16 assessment but rather that panels such as yours and
17 prominent voices such as the many voices that have been
18 appearing before you in your various hearings, will be
19 able strengthen the Law in this regard.

20 I think a falling back on the law is the
21 weakest, the weakest position. The Court of Public
22 Opinion I think is going to provide a far stronger
23 reference for the Canadian population concerned with
24 this and other proposals.

25 I'm not sure whether that answers your



1 question.

2 MR. PIETER VAN VLIET: I take that, to
3 conclude from your statement, that there are no laws
4 being violated to date?

5 MR. ANDREW ORKIN: I wouldn't, I wouldn't
6 put it that way. What I was referring to is a large
7 body of environmental common law which as I'm sure, you
8 and many other people are aware is incremental and
9 garnet, one small step at a time, of which this
10 Rafferty Almeda decision out of the Courts of that
11 province, are one example. I wouldn't feel at all that
12 any specific laws are been broken.

13 MR. PIETER VAN VLIET: Thank you.

14 THE CHAIRMAN: Dr. LaPierre?

15 DR. LOUIS LAPIERRE: The question
16 regarding -- you were critical of the time frame and
17 the funding allotted to the preparation and the major
18 trustee of the brief, looked at social, economics and
19 the possible impact to society.

20 Do you have any idea of what lead time you
21 would want to prepare such documents and I guess an
22 indication of funding, if the level is not sufficient?

23 MR. ANDREW ORKIN: I have a very clear
24 idea if this is not an impudent response as to what
25 kinds of lead time I certainly don't want.



1 And that was my experience in the summer
2 when, if my memory serves me correctly, I received, my
3 office received the package from the from the FEARO
4 office towards the end of June.

5 I was out of town on work in California
6 until close to the end of July, to return to this
7 envelope and discover that I had until the end of
8 August, to submit, to canvas my organization in the
9 middle of Summer and submit a funding request.

10 August was my vacation. As a result of
11 which Lawyers for Social Responsibility simply didn't
12 put in a funding request. We did prior to the deadline
13 submit a protest as I believe a number of other
14 organizations did as well.

15 Two (2) months in normal circumstances
16 could be considered to be an adequate time frame. In
17 the middle of summer when at the start of that period,
18 it's indicated to FEARO that this is unacceptable, I
19 felt was not an acceptable way of proceeding.

20 As to the amounts of money, I think
21 certainly from the perspective of Lawyers for Social
22 Responsibility, if we were to submit a budget which
23 would enable us to participate as a non-profit
24 organization, and that's not charging usual legal fees,
25 it's probably not even charging for our time, but



1 merely with respect to obtaining the expert advice that
2 we require, the budget that the FEARO has, taking all
3 of the participation of organizations such as ours
4 across the country into account, is probably inadequate
5 to a factor of ten (10) or a hundred (100).

6 That is a back of the envelope guess on my
7 part. There are organizations such as Dr. Edwards'
8 Canadian Coalition for Nuclear Responsibility who I
9 think, with a track record of many years of
10 participation in this field, would enhance this
11 proceeding considerably, if they have a meaningful
12 budget to hire staff, rent premises, consult across the
13 country and obtain the expert advice to participate in
14 these substantive hearings.

15 The 500,000.00\$ that has been made
16 available for total public participation, in my view,
17 given a six hundred million dollar proposal, is a drop
18 in the ocean.

19 THE CHAIRMAN: Ms. Roy?

20 MS. LOUISE ROY: Vous avez mis en relation
21 de très larges enjeux qui sont liés soit à la présence
22 de déchets nucléaires ou à la gestion des déchets
23 nucléaires dans le sens d'une approche holistique et
24 vous avez souhaité aussi qu'une large discussion
25 publique puisse s'engager sur toutes ces questions.



1 Est-ce que vous avez des suggestions sur
2 la façon d'entrevoir les principales étapes d'une telle
3 discussion en prenant pour acquis, si je vous ai bien
4 compris, que la première c'est un moratoire sur la
5 production de déchets nucléaires, de nouveau déchets
6 nucléaires?

7 Quelles seraient les autres étapes qui
8 vous apparaîtraient à la fois crédibles et efficaces
9 pour faire un tel débat?

10 MR. ANDREW ORKIN: If I have you
11 correctly, what steps should be undertaken to engender
12 an effective and full public debate in this regard.

13 I think a prerequisite which is one you've
14 repeated for me, is that of a moratorium. I think
15 anything short of a moratorium on the further
16 production of high level nuclear waste, I can only
17 concur with Dr. Edwards' words, is -- would render this
18 process a sham.

19 It is a prejudging of the issue if this
20 panel were to find after so many months or years of
21 work, that there is no safe disposal method, in the
22 interim, to have continued with the production of high
23 level nuclear waste, is to proceed in bad faith, not on
24 the part of the panel but on the part the Canadian
25 Government. And on the part of the proponent.



1 That's my major concern. That
2 demonstration finally and belatedly of good faith to
3 the Canadian public concerned about this question,
4 would in my view, be the, not only a prerequisite but a
5 fundamental beginning and opening up of this question,
6 that would greatly encourage debate on the issue.

7 What further steps could be taken, an
8 indication that the entire agenda is up for grabs,
9 that's a colloquialism, that the energy agenda is open,
10 is fully open for discussion rather than being in any
11 way predetermined and rubber stamps are perhaps being
12 sought for well-laid and well-preconceived plans.

13 Practical steps, an undertaking of a
14 massive public consultation process with which we are
15 not unfamiliar in the Canadian political scene.

16 We have done full commissions of inquiry,
17 with broad and open agendas, which by their formats and
18 by their openness, visit and encourage the
19 participation of a very broad spectrum of the Canadian
20 population.

21 We've seen through the 70's a massive
22 Canadian concern about issues of nuclear power and
23 nuclear waste. This concern has not gone away. If
24 anything, I believe that this concern is not latent but
25 it's on the rise.



1 I unfortunately haven't had the privilege
2 of travelling with your commission but I'm sure you've
3 found interest high or reasonably high in other
4 centres.

5 I think if there was a perception on the
6 part of the concerned Canadian energy, environmental
7 and public participation community, that we were really
8 opening Canada's energy agenda and all of its
9 environmental impacts up for discussion, you
10 wouldn't have to worry about encouraging participation
11 or finding it.

12 It would beat a path to your door and you
13 would be busy beyond your wildest imagination. I'm not
14 sure if that answers your question.

15 MS. LOUISE ROY: En partie. Merci.

16 THE CHAIRMAN: Further questions? A
17 propos your last remarks, you did note what I had to
18 say in my opening statement...

19 MR. ANDREW ORKIN: Yes I did.

20 THE CHAIRMAN: ...to the effect that
21 something of a broader look at the environmental
22 implications of various sources of production of energy
23 is at least started. Exactly how it will develop of
24 course is beyond my capacity to say but I'm sure you'll
25 want to follow that....



1 MR. ANDREW ORKIN: Yes, indeed.

2 THE CHAIRMAN: ...with interest as it
3 starts to emerge. I would perhaps put one question to
4 you. Did, I take from your remarks towards the end of
5 your presentation, that you are assuming that there
6 would not be an Environmental Assessment of a specific
7 site at some later stage?

8 MR. ANDREW ORKIN: No, I made no
9 assumption on that level at all. What I was saying is
10 that I feel that to -- which I think I dealt with at
11 some length, to conduct an environmental assessment
12 absent a particular community, is to prejudice the
13 participation of such a selected community which I feel
14 would be pivotal in this panel's doing a complete job.

15 And that the social and socio-economic and
16 cultural and perhaps spiritual aspects of such a
17 proposal, cannot be considered absent a specific
18 environment and a specific population.

19 I'm confident that at some period in the
20 future, were this panel to find that the proposal is
21 safe, hypothetically, some process of consultation of a
22 target or target communities would be undertaken.

23 My fear is that any favourable finding on
24 the part of the FEARO process at this point, on a
25 hypothetical basis, would as I said, be held up to that



1 community as saying this is now beyond discussion,
2 we've already done that. All we are asking you now for
3 are your perhaps particular and unique views on this
4 situation but the terms of reference of that situation
5 will probably... would probably not re-open the work
6 that you had already done. And I think that, that is a
7 major danger.

8 THE CHAIRMAN: Thank you for that
9 clarification of your position, Mr. Orkin. Thank you
10 very much for appearing before us today.

11 ---Mr. Orkin withdraws.

12 THE CHAIRMAN: The next participant, the
13 Health Professionals for Nuclear Responsibility, Dr.
14 Eric Notebeart. I'm not sure if I'm pronouncing
15 correctly, if not please make the correction for me.
16 PRESENTATION PAR DR ERIC NOTEBEART.

17 Bonjour mesdames, messieurs. Je
18 représente les Professionnels de la santé pour la
19 responsabilité nucléaire qui est l'aile québécoise de
20 l'Association canadienne et de l'Association
21 internationale des médecins pour la prévention de la
22 guerre nucléaire. Je suis médecin et travaille à titre
23 de président par intérim de l'organisme actuellement.

24 Je voudrais tout d'abord remercier le
25 Bureau fédéral d'examen des évaluations



1 environnements d'ouvrir cette Commission chargée
2 d'examiner la gestion des déchets de combustible
3 nucléaire aux citoyens, citoyennes et groupes
4 intéressés.

5 Je parlerai donc aujourd'hui d'un point de
6 vue spécifiquement médical; je vous rappelle que notre
7 organisme représente six cents (600) professionnels de
8 la santé, essentiellement des médecins au Québec, et à
9 peu près huit mille (8 000) au Canada.

10 Après un préambule qui situe la question
11 de l'énergie nucléaire dans une perspective médicale,
12 je traiterai du projet précis tel qu'élaboré par
13 Energie Atomique du Canada Ltée, puis de questions
14 connexes, et enfin terminerai avec notre position en ce
15 qui a trait à ce domaine-là.

16 En guise de préambule je vais présenter
17 trois (3) catégories d'études qui forment la base de
18 notre position. Tout d'abord, évidemment, la question
19 d'Hiroshima-Nagasaki.

20 Lors de notre dernier congrès
21 international à Hiroshima en octobre mil neuf cent
22 quatre-vingt-neuf (1989), l'état des travaux de
23 plusieurs chercheurs a été présenté et c'est tout
24 récent ces choses-là.

25 Ainsi, l'incidence de leucémie,



1 particulièrement de leucémie à présentation atypique,
2 de leucémie myéloïde chronique, cinq (5) à six (6) ans
3 après la bombe il a été statistiquement extrêmement
4 élevé dans la région des deux (2) villes mentionnées.

5 On parvient à peine aujourd'hui, après une
6 latence à laquelle on s'attend, après une latence de
7 quarante (40) à cinquante (50) ans, à une augmentation
8 de l'incidence du cancer du sein, du poumon, de
9 l'oesophage, de l'estomac, du colon, de la vessie, de
10 l'utérus, du myélo multiple. C'est des choses
11 importantes.

12 Cependant, il y a des cancers dont
13 l'incidence n'augmente pas: le foie, la vésicule
14 biliaire, par exemple. Et ceci, directement relié à la
15 dose des radiations et à la proximité de l'épicentre
16 des deux (2) bombes atomiques.

17 Je vous rappelle que les études qui ont
18 servi de base à ces travaux-là sont des études tout à
19 fait crédibles qui ont été publiées dans le New England
20 Medical Journal of Medecine ou dans "The Lancet" ou
21 dans d'autres journaux médicaux importants.

22 D'autres médecins, le docteur Awa, entre
23 autres, se sont intéressés aux effets génétiques après
24 les bombes atomiques, en particulier ils se sont
25 intéressés à la fréquence des grossesses qui se sont



1 terminées en mortinaissances, la fréquence des
2 malformations congénitales, la fréquence de décès dans
3 la première (lère) semaine de vie chez les mères
4 exposées. Son équipe s'est intéressée au taux de
5 décès des enfants nés après le premier (1er) mai
6 quarante-six ('46), donc neuf (9) mois après la bombe,
7 ce qui nous montre l'effet de l'irradiation des gonades
8 de la mère ou du père.

9 Son équipe s'est intéressée à la fréquence
10 des anomalies chromosomiques, à la fréquence des
11 mutations telles que détectées par électrophorèse des
12 protéines.

13 A chaque fois on montre une incidence
14 augmentée de ces problèmes-là; cependant, c'est vrai,
15 non statistiquement non significatifs. Il ne faut pas
16 oublier que l'échantillonnage est très petit et qu'il y
17 a plusieurs sources d'erreur.

18 Une autre équipe, l'équipe du docteur
19 Yoshimoto termine actuellement l'étude des cancers chez
20 les enfants, les jeunes filles qui étaient exposées et
21 qui avaient, à ce moment-là, peut-être entre un (1) an
22 et cinq (5) ans; alors on est rendu à la deuxième (2e)
23 génération et on arrive aussi à un taux augmenté de
24 différents types de cancer. Ce sont des choses qui
25 nous préoccupent beaucoup.



1 D'autres ordres d'études, ce sont des
2 études comme celle effectuée à Sellafield, de Gardner
3 et al, que l'on connaît bien, qui démontrent chez les
4 descendants de pères travailleurs à Sellafield une
5 incidence beaucoup plus élevée de leucémie et de
6 lymphomes, en particulier en fonction de la dose
7 d'irradiation, en particulier chez les pères irradiés à
8 100mSv et plus.

9 Maintenant c'est difficile d'extrapoler,
10 c'est difficile de partir des études d'Hiroshima et
11 Nagasaki pour arriver aux situations actuelles; c'est
12 difficile d'essayer de se projeter dans le futur pour
13 essayer de voir qu'est-ce qui se passerait si jamais il
14 y avait un accident avec les sites d'enfouissement. On
15 a quelques éléments d'aide, les études de Beir que tout
16 le monde connaît bien, Beir V la dernière qui est
17 sortie en quatre-vingt-dix ('90).

18 Ce comité-là étudie, finalement, les
19 effets biologiques de radiations ionisantes et soumet
20 ses recommandations ou soumet ses travaux au Centre
21 National de Recherche Américain.

22 Une méta analyse de plusieurs travaux
23 amène à des choses qui sont intéressantes; je n'ai pas
24 le tableau, je ne peux pas vous le montrer mais les
25 gens du panel ont le tableau, en fait ce qu'on voit



1 c'est que, finalement, pour une population d'un (1)
2 million d'habitants, les malformations à trait
3 autosomal dominant qui ont une incidence à peu près de
4 deux mille cinq cents (2 500) par million de nouvelles
5 naissances par génération, vous voyez une augmentation
6 de cinq (5) à vingt (20) cas par dose d'irradiation de
7 un (1) rem sur une génération de trente (30) ans;
8 j'espère que je ne deviens pas trop abstrait, mais ce
9 que ces travaux-là concluent c'est que finalement
10 lorsqu'il y a une irradiation, une source extérieure,
11 autant les maladies autosomales dominantes que les
12 maladies liées au X que les maladies récessives, voient
13 une augmentation de leur incidence à chaque génération.

14 C'est parfois une augmentation qui est
15 petite, j'en conviens, mais c'est une augmentation qui
16 est présente, et la question qu'on se pose est la
17 suivante: Est-ce qu'on a éthiquement le droit de dire
18 à nos arrières-arrières-petits-enfants que oui, grâce à
19 nos choix énergétiques, il y aura quelques leucémies de
20 plus, quelques lymphomes, quelques cancers de plus? Je
21 pense que pour nous la question fondamentale c'est
22 vraiment ceci; même si on arrive à trouver que
23 l'incidence est faible, elle est présente.

24 Je vais poursuivre et je vais arriver au
25 centre de notre problème.



1 Ce que mentionnent ces auteurs-là, ils
2 mentionnent par exemple que pour les maladies
3 autosomales dominantes on a une augmentation de six (6)
4 à trente-cinq (35) cas par million de personnes par
5 rad; pour les maladies liées au X, cinq (5) par
6 million par rad; pour les maladies récessives
7 inférieures à une (1) par million par rad, million de
8 population.

9 Ce sont des travaux qui nous préoccupent
10 et qui nous invitent à une prudence extrême.

11 Maintenant étudions un peu le projet
12 d'enfouissement des déchets nucléaires tel qu'élaboré
13 par Energie Atomique du Canada Ltée. Je me suis arrêté
14 plus spécifiquement, même si on parle d'un concept,
15 plus spécifiquement au projet tel que présenté
16 d'enfouissement dans le Bouclier Canadien.

17 Dans le document on mentionne qu'après
18 cinq cents (500) ans l'essentiel des rayons gamma va
19 être transformé et qu'il restera essentiellement des
20 rayons alpha et bêta. Ce que l'on veut rappeler ici
21 c'est que les déchets sont faits à quatre-vingt-dix-
22 huit pour-cent (98%) d'uranium-238 dont la demi-vie est
23 quatre point cinq (4.5) milliards d'années; d'uranium-
24 235, d'uranium-234 dont la demi-vie est de deux cent
25 cinquante mille (250 000) ans.



1 L'uranium, on le sait, se désintègre, par
2 exemple en radium-226, la demi-vie c'est mille six cent
3 (1 600) ans, mille six cent soixante-deux (1 662); ça
4 donne aussi du radium-222 qui est un gaz; ça fait
5 aussi du polonium-218, de polonium-210 qui est aussi
6 toxique certainement que le plutonium-239; de l'iode-
7 129 dont on connaît les effets sur la thyroïde et dont
8 la demi-vie est de dix-sept (17) millions d'années.

9 EACL ne semble pas s'inquiéter du fait
10 qu'après cinq cents (500) ans les émissions sont
11 réduites à point quatre-vingt-deux (.82) mSv à l'heure.
12 Qu'est-ce qui arriverait s'il y avait une catastrophe
13 dans cinq cents (500) ans si, par exemple, la
14 population était exposée à ce point quatre-vingt-deux
15 (.82) mSv à l'heure? Et bien c'est simple, en deux (2)
16 semaines seulement les individus auraient accumulé un
17 rem. Je vous ramène au tableau que j'ai mentionné
18 tantôt. En deux (2) mois? On aurait doublé le risque
19 de mutation génétique, on aurait atteint cent (100)
20 rem.

21 Qu'est-ce qu'il adviendrait si l'accident
22 survenait dans la vie, par exemple, de mes petits-
23 enfants, dans cent (100) ans? C'est très très simple:
24 en un jour ils vivraient l'équivalent des explosions
25 atomiques. Après quelques heures leur risque de



1 mutation doublerait déjà.

2 On a de la misère un peu à envisager ceci
3 avec sérénité, comme professionnel de la santé.

4 Etudions plus précisément le projet
5 d'enfouissement en quatre (4) barrières.

6 L'enceinte la plus externe, comme vous le
7 savez, consiste en un matériau de granit - je ne suis
8 pas le premier (1er) qui le mentionne, on l'a déjà
9 dit - le granit, une de ses caractéristiques c'est
10 d'être très cassant, donc de faire facilement des
11 fractures, donc possiblement d'amener la voie à des
12 courants d'eau souterrains qui atteindraient, à ce
13 moment-là, la troisième (3e) barrière, celle qui est
14 faite d'argile et de sable.

15 C'est vrai que c'est imperméable l'argile
16 et le sable, mais pas complètement, surtout pas quand
17 on sait que les déchets radioactifs risquent d'émettre
18 de la chaleur et à ce moment-là on peut douter de
19 l'effet tout à fait tampon de cette troisième (3e)
20 barrière-là.

21 On parle de la deuxième (2e) barrière en
22 titane ou en cuivre - il y a d'autres matériaux
23 possibles - est-ce qu'on est bien sûr qu'ils soient à
24 l'abri de la corrosion dans ces situations-là?

25 Imaginons que, finalement, ces barrières



1 sont perturbées. Qu'est-ce que va faire la mise en
2 circulation d'éléments radioactifs dans un écosystème?
3 quelles vont être les transformations au niveau
4 biologique, au niveau moléculaire, cellulaire puis au
5 niveau du règne végétal puis du règne animal? Je ne
6 pense pas qu'on a répondu du tout encore à ces
7 questions-là.

8 J'ai mentionné un mot à propos du
9 transport. On mentionne qu'on a fait subir les
10 conteneurs à des stress de, par exemple, huit cents
11 (800) degrés Celsius de température, on a fait tomber
12 les conteneurs de neuf (9) mètres de haut, ça nous
13 semble loin en deçà de ce que doivent être des normes
14 de sécurité pour des conteneurs transportés sur les
15 routes canadiennes.

16 Je vais aborder, avant de terminer, les
17 questions connexes, c'est ce dont nos amis ont parlé,
18 les "terms of reference" si je comprends bien. Tout le
19 projet des déchets nucléaires tel que mentionné,
20 finalement ne touchent que point zéro un pour-cent
21 (.01%) de tout l'uranium utilisé. Il ne traite pas du
22 tout des résidus de concassage dont cent soixante-
23 quinze (175) millions de tonnes sont à l'air libre
24 actuellement. On pense que ça peut être un problème
25 majeur de santé publique et on aimerait certainement



1 que la Commission d'évaluation de l'effet des déchets
2 s'arrête à cette question-là.

3 On n'a pas parlé non plus des réacteurs
4 déclassés, de tout le matériel afférent à ces réacteurs
5 là qui font partie aussi des déchets de l'industrie
6 nucléaire.

7 Nos recommandations sont finalement
8 simples. En fait les professionnels de la santé
9 demandent donc à Énergie Atomique du Canada de ne pas
10 procéder à la mise en chantier du site d'enfouissement.

11 Peut-être de conserver, actuellement, les
12 déchets, si on ne parle que des déchets, de la façon
13 actuelle pour pouvoir mieux, actuellement, évaluer les
14 effets, les interactions avec l'environnement de ces
15 déchets-là. Une fois qu'ils seront enfouis on ne
16 pourra plus monitorer l'effet de ces déchets-là.

17 On demande aussi à Énergie Atomique du
18 Canada de poursuivre les travaux de recherche
19 fondamentale en géologie, en physique, en chimie, en
20 biologie, en vue d'obtenir des résultats beaucoup plus
21 probants, voire conclusifs, dans le futur, et de
22 soumettre à nouveau ces résultats aux personnes, aux
23 groupes qui sont intéressés comme nous ce soir.

24 Merci.

25 PAR LE PRÉSIDENT: Merci beaucoup docteur.



1 C'est un argument à étudier plus profondément et nous
2 allons le faire certainement, mais entre-temps est-ce
3 qu'il y a des questions que les membres de la
4 Commission veulent poser maintenant au docteur
5 Notebeart?

6 Merci beaucoup et merci pour le point de
7 vue de votre organisation, c'est très utile pour nous
8 de l'avoir. Merci.

9 ---Dr. Notebeart withdraws.

10 THE CHAIRMAN: The next person I have on
11 my list wishing to address the panel and those present
12 is Mrs. Mary Evans Bapst. I wonder if she would come
13 forward.

14 PRESENTATION BY MRS. MARY EVANS BAPST:

15 I am not a technician, scientist, or
16 health professional. But I have served for six (6)
17 years as an active associate member of International
18 Physicians for the Prevention of Nuclear War, IPPNW, in
19 various capacities including temporary assistant in the
20 Boston Central Office, Regional Contact Person and
21 member of the IPPNW Executive Board of Switzerland,
22 where I lived for thirty (30) years and currently as
23 executive secretary of IPPNW's Quebec chapter.

24 I have also been an official delegate at
25 four (4) IPPNW International Congresses as well as a



1 half-dozen regional ones and I have read material
2 related to nuclear matters over many years. I'm
3 probably better informed than the average citizen on
4 the issues we are considering here today.

5 But I'm here because I'm a mother and a
6 grandmother, and I wish to explore as specified in the
7 terms of reference of this panel, one of the social
8 implications of a possible nuclear fuel waste facility:
9 FEAR.

10 If I occasionally use examples situated
11 outside of Canada, it is because the bulk of my life
12 has been spent elsewhere, but I consider the lessons of
13 that experience to be applicable here.

14 Two (2) weeks ago, at a sometimes heated
15 discussion following the presentation of the NFB film
16 "Uranium", Ian Wilson of AECL suggested that it was not
17 appropriate to become emotional over the issue of
18 nuclear waste.

19 I spoke to Mr. Wilson after the meeting
20 saying in substance humans were created as rational
21 beings gifted with emotions. This combination is what
22 keeps us in balance. I believe there is a place for
23 rational fear. It serves as a sort of distant early
24 warning system in our daily lives and is an important
25 aspect of child training and eventual arrival at



1 wisdom.

2 "Attention, tu vas tomber, te brûler, te
3 faire mal". I raised my children in French. Fear
4 teaches us to be worry of the unknown, to learn
5 prudence. It serves to galvanize psychological defence
6 mechanisms. It makes adrenalin flow. It also makes my
7 hands shake! It can unite weak individuals into strong
8 coalitions. It become a great force for evil or for
9 good. It is the basis for confrontation and a powerful
10 justification for peaceful conflict resolution.

11 Fear can also foster anguish leading to
12 psychosis and cause individuals and communities, social
13 stress amounting to a severe health hazard.

14 Faced with the fact that science has not
15 yet found satisfactory solutions for disposal of the
16 wastes of a hazardous technology still in its earliest
17 infancy, but which threatens uncounted future
18 generations with un-measurable -- because still largely
19 unknown effects -- little wonder that many people live
20 in fear and demand, sometimes rather emotionally, more
21 reliable information.

22 Such fear must be taken into account in
23 any study relating to nuclear applications, unless the
24 technology exists, again as some fear, only to
25 perpetuate itself, to the exclusion of assured



1 permanent benefit to all the inhabitants of this
2 planet.

3 How might such fear be addressed? Here is
4 an example. On September 21st of this year, as the
5 result of a public initiative gathering more than a
6 hundred thousand signatures, 53% of Swiss voters
7 obtained a ten (10) year moratorium on all new
8 construction and exploitation of nuclear facilities
9 pending deeper study of the problem of nuclear fuel
10 waste disposal.

11 This is all the more striking when one
12 learns that 70% of Swiss electricity is nuclear
13 generated. The population of one of the world's most
14 highly developed countries is willing to forego a
15 certain degree of comfort in the short term for fear of
16 allowing a major mistake to affect the very long term.

17 The government accepted the challenge and
18 the matter was put to a federal vote: democracy at
19 work.

20 My family's chalet lies in a township
21 where for the past ten (10) years, the Swiss CEDRA,
22 Commission d'étude des déchets radioactifs, has been
23 attempting to establish a nuclear fuel waste disposal
24 site in a disaffected section of a salt mine, Les
25 Salines de Bex.



1 This area is highly dependent on tourism.
2 Three (3) major resorts and a spa lie within a fifteen
3 (15) kilometres radius, Villars, Les Diablerets, Leysin
4 and Bex-les-Bains, Gstaad, the Bernese Oberland and
5 Zermatt, are approached by major highway and rail
6 systems passing within a two (2) kilometres of the
7 projected site.

8 What of transporting radioactive cargo
9 through this area or equivalent places in Canada? Road
10 and rail accidents happen everywhere. So less
11 frequently, do earthquakes. Both have occurred within
12 my lifetime in the area I just mentioned. Such events
13 have raised social consciousness to the level of fear
14 and there are many questions that must be
15 satisfactorily answered before the concept of nuclear
16 fuel waste disposal, indeed the concept of continuing
17 to create these wastes, can be accepted.

18 Are the AECL and the Canadian Government
19 prepared to guarantee present and future security, for
20 all practical purposes forever, in the treatment and
21 disposal of nuclear fuel waste?

22 Are they aware of the level of concern,
23 the shadow of real fear, and the extent of the denial
24 of that fear, under which Canadians live?

25 Have they studied the psychological reports



1 on children in various parts of the world who live in
2 fear of some form of nuclear catastrophe occurring to
3 them before they have time to grow old?

4 A vignette of Hiroshima: the daughter of
5 two (2) survivors told me, weeping that her only son,
6 now 19, does not expect to live to age of 40 given the
7 state of the nuclear world.

8 My own four (4) children and their budding
9 families live in Geneva, barely eighty (80) kilometres
10 upwind, usually, of the French experimental fast-
11 breeder reactor called Super Phénix, at Creys-Malville.

12 Geneva, Lauzanne, Grenoble, Lyon, Mâcon,
13 Dijon and their surrounding agglomerations include some
14 five million (5M) inhabitants, all menaced not only by
15 extrusion, the professional euphemism for explosion,
16 but also by contamination from ill-managed waste,
17 inadequate transport norms, all forms of natural and
18 unnatural accidents which could affect nuclear
19 generators and fuel wastes accumulation sites. And I
20 have not yet mentioned industrial and governmental
21 secrecy as well as the attendant police repression
22 which have pervaded the imposition of nuclear programs
23 on the French and neighbouring Swiss populations.

24 Might this become standard practice in
25 Canada? Is it ethically permissible for a few



1 political and industrial leaders to impose on a nation
2 an unproven technology which may cause genetic damage
3 to all living creatures and poison the very substance
4 of the planet for the rest of its existence?

5 The hisses and boos directed at some of
6 the conciliatory statements made by AECL participants
7 at the Uranium film panel certainly indicate public
8 distrust. How are these fears to be effectively and
9 legitimately allayed?

10 Until all the above questions, and many
11 others, are adequately answered, it cannot be morally
12 acceptable to proceed with further waste accumulation.
13 Ignoring the problem will not make it go away. This by
14 the way, is a powerful argument for waste-containment
15 as opposed to burial, our "out of sight, out of mind"
16 attitude may only compound environmental problems
17 future generations will be condemned to deal with.

18 A recent Canadian Nuclear Association CNA
19 television ad, shows children contentedly playing in a
20 model city, supposedly lit by nuclear generated
21 electricity.

22 An earlier one state that CNA is, I quote,
23 "engaged in ongoing research for the responsible
24 management of nuclear waste."

25 If equal time and funding were available



1 to anti-nuclear groups, the public would have access to
2 information which, were no more reliable, would at
3 least allow for a reassuring possibility of choice.
4 The people who feel threatened by nuclear technologies
5 must be allowed to register their apprehension without
6 being ridiculed, and be guaranteed serious
7 consideration of their legitimate fears.

8 Their distrust may be well-founded if one
9 judges from a memo circulated within the industry
10 suggesting defamation and infiltration of anti-nuclear
11 groups as possible ways to silence them.

12 Populations meant to benefit from the
13 advance of science should not become its victims.
14 Scientific integrity is a moral must. Even more so in
15 this instance where the future well-being of the planet
16 could be compromised forever.

17 Yet another fear provoking reflection,
18 nuclear technology was initially developed for the
19 avowed purpose of mass killing and destruction.

20 Despite many sincere attempts to improve
21 its image and convert it to more humanitarian ends, it
22 quietly continues to kill through occupational
23 sickness, accidents, fallout and genetic damage
24 resulting from nuclear power plants and their attendant
25 wastes.



1 The nuclear debate seems to me, all too
2 often, to be based on statistics and projections of the
3 coldest, driest kind. I would like to see it raised to
4 another level.

5 We humans are, after all, this planet's
6 only rational creatures, gifted with foresight and
7 compassion.

8 Government and industry seem to depend
9 more on annual productivity reports than on human
10 factors which are difficult to quantify on paper.

11 I remember a graph sent to me in Chicago
12 by my civil-engineer fiancé who live in Geneva. It was
13 his calculation of our happiness-curve as determined by
14 the distance in kilometres between these two (2)
15 cities, the time between now and our wedding date
16 several months hence, and key events occurring in the
17 interval such as birthdays, important decisions etc.

18 Hindsight proved the curve to have had
19 little relation to reality. But in the same mail, he
20 sent a living rose from the garden that was to be mine.
21 There is a message here if we are wise enough to read
22 it. Allow me this.

23 Every aspect of social health related to
24 nuclear techniques and their radioactive wastes must be
25 exhaustively examined and publicly reviewed before we



1 continue down this unfamiliar road which is no garden
2 path. Care must be taken to separate short term
3 economic gain from subsequent damage to the social
4 fabric. The quality of the mental health of human
5 beings, among them your grandchildren and mine, must
6 come first.

7 Also, before any final decision is taken
8 concerning nuclear fuel waste disposal, which would
9 affect millions of people for millions of years,
10 fairness requires that we spend millions of dollars to
11 examine all possible options not causing environmental
12 damage or destruction.

13 Expenditure equivalent to the sums spent
14 ramming through the nuclear agenda has never been
15 allocated to serious study and implementation of
16 alternative programs such as energy efficiency,
17 conservation, solar, geo-thermal et cetera. Instead of
18 paying to poison the planet, we should be eager to
19 invest in safety, which would contribute to our sanity.
20 That such millions are available is obvious, we know
21 where they are going. What we don't seem to know is
22 where we are going.

23 Government must publish a White Paper
24 detailing every aspect of the above studies, with
25 criteria and projects for the implementation of safer



1 options, complete with timetables, comparative cost
2 estimates, as well as environmental and social impact
3 studies.

4 The social aspect must include studies on
5 job loss and creation, the possible psychological and
6 educational implications of reconversion, and must show
7 real sensitivity toward local issues and indigenous
8 populations.

9 All of this will require not just money,
10 but time. Decisions entailing long term consequences
11 should not be rushed in to. We may not have enough
12 patience, money or honesty, but we certainly have
13 plenty of time. It stretches without limit before us.
14 The question is, are we going to use it wisely.

15 In conclusion, I am deeply concerned about
16 the narrow terms of reference established here.
17 Studying nuclear fuel waste on its own is rather like
18 considering the treatment of a possibly malignant
19 tumour, without relation to its effect on the patient.
20 The scope of these hearings must include examination of
21 all the links in the nuclear chain and recognition of
22 their relationship to each other: uranium mining,
23 tailings, processing, reactors, plutoniums, weapons and
24 every poisonous waste generated along the way.

25 Meanwhile, a moratorium must be declared



1 on nuclear development including the mining of uranium.
2 It is the cause of our predicament.

3 Allowing the problem to increase while
4 admitting ignorance of how to deal with it is not only
5 illogical but irresponsible. I firmly believe that
6 solving these questions places upon our generation a
7 moral responsibility we cannot, and dare not, evade.

8 And for you help in an honest search for
9 solutions that we and all future generations can live
10 with, I thank you.

11 THE CHAIRMAN: Thank you very much Mrs.
12 Bapst for the time and thoughts that you've certainly
13 put into that presentation.

14 Are there any questions which any members
15 of the panel would like to put to Mrs. Bapst while
16 she's here? Dr. Wilson?

17 DR. LOIS WILSON: Yes, I'm interested that
18 you've mentioned the perceived fears and the real fears
19 of the public around this question. And you've raised
20 the question "how are these fears to be effectively and
21 legitimately allayed."

22 Do you have any answer to that or by whom
23 and with...

24 MRS. EVANS BAPST: No.

25 DR. LOIS WILSON: Just a moment, and are



1 there any questions that could be addressed to AECL
2 which might help to do that?

3 MRS. EVANS BAPST: My question can be
4 answered by another question, your question can be
5 answered by my question, this is why I'm here, to ask
6 the questions.

7 We must all search for these answers
8 together. I don't have solutions. The first
9 solution that I did suggest and that was mentioned by
10 all our panellists, was moratorium. Not to go ahead
11 with anything that we are not sure of until we can
12 guaranty. Because if we can reassure the population,
13 than -- except that I wonder if we can.

14 THE CHAIRMAN: Mr. Van Vliet?

15 MR. PIETER VAN VLIET: Mrs. Bapst, you
16 make reference in your presentation to a memo that have
17 circulated within the industry suggesting defamation
18 and infiltration of anti-nuclear groups possibly to
19 silence them. Do you have that memo?

20 MRS. EVANS BAPST: I don't have it with me
21 but I know where to get my hands on it and I can
22 produce it. I'll see that you get it.

23 MR. PIETER VAN VLIET: Thank you.

24 THE CHAIRMAN: Any further questions?
25 Thank you very much indeed Mrs. Bapst.



1 ---Mrs. Bapst withdraws.

2 THE CHAIRMAN: This completes the list of
3 people who were inscribed before hand and before this
4 meeting opened, to speak to us this evening.

5 But as has been the case in other centres,
6 I now open the meeting to any others who would wish to
7 address us while we're here.

8 If there is no one who would like to speak
9 to us, may I remind you that if there are some thoughts
10 which you'd like to convey to us in writing, please so.

11 We will welcome them as much as your oral
12 presentations at this series of meetings. We would
13 appreciate it if you could try to get those to us by
14 about the end of this month.

15 And with that, I would like to thank you
16 all for being present this evening to take part in
17 these proceedings. I'd like to thank particularly
18 those who made presentations to us, thoughtful ones and
19 ones which we'll certainly give further attention to.

20 I'm going to close this part of the
21 evening's proceedings but please feel free, I hope some
22 of you will, to stay a bit longer and have some of that
23 informal conversation amongst each other and with
24 members of the panel also, which is frequently a very
25 valuable part of any meeting of this kind.



1 Thank you very much indeed for coming. We
2 shall be back tomorrow morning for a continuation of
3 the session in Montreal. Thank you very much, merci
4 beaucoup.

5
6 -- Whereupon the hearing was adjourned at 9:10 p.m. to
7 recommence at 09.00 a.m., Friday, November 16th, 1990.

8
9
10 I, YVAN G. LEMAY, the undersigned Official
11 Court Reporter, hereby certify the
12 foregoing is a true and faithful
13 transcript of these hearings taken by
14 means of stenomask.

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YVAN G. LEMAY,
Official Court Reporter

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ENVIRONNEMENTALES

Held at: Auditions tenues au:
Le Nouvel Hotel
Montréal, Québec

Date: Friday, November 16, 1990
Vendredi le 16 novembre, 1990

Volume: 14

B E F O R E / D E V A N T :

MR. BLAIR SEABORN

Chairman/Président

MS. LOUISE ROY

Member/Membre

MR. PIETER van VLIET

Member/Membre

DR. LOUIS LAPPIERRE

Member/Membre

DR. WILLIAM FYFE

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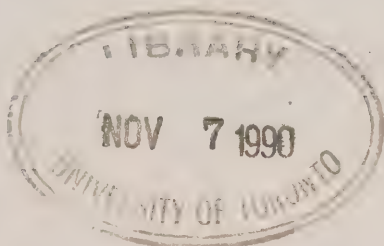
BUREAU FÉDÉRAL D'EXAMEN
DES ÉVALUATIONS
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DE LA GESTION DES DÉCHETS
DE COMBUSTIBLES NUCLÉAIRES

SCOPING MEETINGS
RÉUNIONS DE DÉTERMINATION DE L'IMPORTANCE DES PROBLEMES

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09:00 a.m. - 09:00 heures



VOLUME 14

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MR.	BLAIR SEABORN	Chairman/Président
MS.	LOUISE ROY	Member/Membre
MR.	PIETER van VLIET	Member/Membre
DR.	LOUIS LAPIERRE	Member/Membre
DR.	WILLIAM FYFE	Member/Membre



A P P E A R A N C E S

1		
2	MR. JEREMY STILES	ENVIRONMENTAL COALITION
3		FOR PRINCE EDWARD
4		ISLAND
5	MS. CAROL KARAMESSINES	PRIVATE CITIZEN
6		
7	MR. DON WEDGE	PRIVATE CITIZEN
8	DR. MICHAEL R. DENCE	ROYAL SOCIETY OF
9	DR. ROBERT H. HAYNES	CANADA,
10	MR. M.A.J. METICH	CANADIAN ACADEMY OF
11		ENGINEERING
12	MR. WALTER ROBBINS	PRIVATE CITIZEN
13	MS. JUDITH BERLYN	PRIVATE CITIZEN
14	MRS. GENE PERRAULT	MONTREAL RAGING
15		GRANNIES
16	MS. ANETTE HENRICKSA	PRIVATE CITIZEN
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1 ---Upon commencing at 9:00 a.m.

2 LE PRÉSIDENT: Si vous voulez vous
3 asseoir, on peut commencer la séance de ce matin.
4 Soyez les bienvenus à ces réunions de détermination de
5 l'importance des problèmes tenues par la Commission
6 d'Evaluation Environnemental, chargée de l'examen du
7 concept de gestion et de stockage des déchets de
8 combustibles nucléaires.

9 La présente réunion sera tenue et en
10 anglais et en français, il y a un service de traduction
11 bien sûr. On peut présenter dans une ou l'autre des
12 deux (2) langues officielles.

13 Il y a des écouteurs si on veut être sûr
14 de suivre dans une langue différente pour le
15 participant.

16 Permettez-moi de vous présenter les
17 membres de la commission qui sont avec moi ce matin.
18 Celui qui vient de nous échapper ou essaie de
19 s'échapper au fond de la salle maintenant, c'est
20 monsieur Pieter Van Vliet, de Régina, qui ingénieur en
21 mécanique, aussi membre du Sénat de l'Université de
22 Régina.

23 A ma gauche immédiate, monsieur Louis
24 LaPierre de Moncton, professeur du département de
25 biologie de l'Université de Moncton et président du



1 Conseil de l'Environnement du Nouveau-Brunswick.

2 A ma droite immédiate, madame Louise Roy
3 de Montréal, consultante de le domaine de
4 l'environnement et des affaires publiques. Elle était
5 auparavant vice-présidente du Bureau d'Audiences
6 Publiques sur l'environnement, et en ce moment, elle
7 est membre du Conseil Canadien de Recherches sur
8 l'Evaluation Environnementale.

9 Et encore à la droite de la table,
10 monsieur William Fyfe de Londres Ontario, professeur de
11 géologie à l'Université de Western Ontario, où il est
12 doyen de la faculté des sciences.

13 Mon nom est Blair Seaborn. Je suis
14 président de la Commission. J'habite Ottawa, je suis
15 actuellement à la retraite. Et j'étais anciennement et
16 précédemment, sous-ministre de l'environnement et
17 président de la Commission Mixte Internationale.

18 Les membres de notre secrétariat, monsieur
19 Bob Greyell à la table ici et au fond de la salle,
20 madame Suzan Toller et je crois madame Suzan Flanagan
21 qui sont tous là pour vous aider si vous en avez
22 besoin.

23 Cet examen est effectué conformément au
24 processus fédéral d'évaluation et d'examen en matière
25 d'environnement.



1 One of the requests put to the panel, has
2 been to examine the nuclear fuel waste management and
3 disposal concept, a proposal for permanent disposal of
4 used nuclear fuel deep in the granitic rock of the
5 Canadian shield.

6 This is a proposal which has been put
7 forward by Atomic Energy of Canada Limited, one which
8 would have nuclear wastes inside corrosion resistant
9 containers placed in holes drilled in the floor of a
10 room inside a vault, something like a very deep mine.

11 Let me say a few words about the panel's
12 mandate. The terms of reference state that the panel
13 is to review the safety and acceptability of the
14 concept for geological disposal of nuclear fuel waste
15 in Canada, the one proposed by Atomic Energy of Canada
16 Limited but, in addition to the AECL proposal, we shall
17 examine a broad range of nuclear fuel wastes management
18 issues including long term management, transport and
19 environmental, social and economic effects.

20 We shall look at approaches to nuclear
21 fuel wastes management and disposal being developed
22 elsewhere in the world. Since site selection will not
23 occur until a disposal concept has been accepted as
24 safe, the panel will not consider any specific sites
25 but will review the potential availability of sites and



1 the methodology and criteria required for selecting
2 them.

3 Let me also say a word about what is not
4 in the panel's mandate and therefore, will not be
5 addressed in this review. The energy policies of
6 Canada and the provinces, the role of nuclear energy
7 within those policies including the construction,
8 operation and safety and new or existing nuclear power
9 plants, fuel reprocessing as an energy policy and the
10 military application of nuclear technology, all of
11 these are excluded from our mandate.

12 I would like it to be very clear however,
13 that the members of this panel are very much aware of
14 the broader concerns related to the use of nuclear
15 materials and the use of nuclear power for the
16 generation of electricity.

17 The panel has been urging a broader review
18 of the comparative environmental implications of the
19 various methods of generating electricity. Steps have
20 now been taken to get such a review under way. Letters
21 have been sent from the federal Department of Energy to
22 provincial departments, and to a number of interest
23 groups both environmental and energy, with a request
24 that comments be returned quickly on proposed terms of
25 reference and I hope that this review will be under way



1 before too much longer.

2 The purpose of these scoping meetings is
3 to allow participants to identify issues that need to
4 be addressed in the Environmental Impact Statement that
5 is to be prepared by AECL. The panel is not requesting
6 the presentation of opinions on the substance of the
7 disposal concept at this time.

8 Following these meetings, the panel will
9 prepare draft guidelines for the preparation of the
10 Environmental Impact Statement and we shall be inviting
11 public comment on those over a period of at least
12 thirty (30) days.

13 Once the panel is satisfied and then on
14 that basis, we'll give of course the final version of
15 our guidelines to AECL, they will undertake the
16 preparation of the Environmental Impact Statement, a
17 process which may well last a year, a year and a half
18 (1½).

19 Once the panel is satisfied that AECL has
20 addressed satisfactorily all the items identified in
21 the guidelines, we shall hold public hearings.
22 Participants will be asked to discuss the acceptability
23 of AECL's disposal concept in detail at this stage of
24 the Review.

25 The panel will consider all comments



1 submitted to it, and will as its final act, prepare a
2 report to the ministers of Environment and of Energy,
3 Mines and Resources.

4 I would ask that those who have registered
5 to speak should attempt to summarize their concerns in
6 approximately fifteen (15) minutes unless they had made
7 some previous request for an additional ten (10)
8 minutes of time.

9 The panel will pay equal attention to
10 written and to oral statements. Panel may ask
11 questions of clarification following each presentation.

12 If you would like to make a presentation
13 and have not yet made that known, perhaps you'd be good
14 enough to speak to a member of the secretariat so that
15 we can get your name on the list.

16 In addition to what we receive at this
17 round of public meetings, we will accept written
18 submissions identifying issues and concerns up to and
19 including November 30th, 1990.

20 May I call now on the first (1st) of our
21 participants for this morning, Mr. Don Wedge. Is Mr.
22 Wedge not here? I know that he had not signified his
23 presence to the secretariat but we were expecting him
24 this morning.

25 If not, I'll move on to the next person on



1 my list, and hope that Mr. Wedge will appear before we
2 go too much farther.

3 The Royal Society of Canada to be
4 presented and the views to be presented by Mr. Michael
5 Dence.

6 We don't seem to be doing very well. He's
7 coming at 09:40, O.K. fine. I think that the confusion
8 may have arisen from the fact that we were expecting to
9 have a presentation here this morning from the World
10 Uranium Hearing, but because it would have been in many
11 ways duplicative of a very good presentation we heard
12 in Quebec City, the decision was taken by that
13 organization that they would not repeat what they had
14 put forward in Quebec, on behalf of the Union
15 Québécoise pour la Conservation de la Nature.

16 Those of you who are interested in those
17 views of course, can have access to the transcript and
18 also to the written presentation as you can to any
19 other transcripts and written presentations from others
20 who have participated in hearings elsewhere.

21 If Mr. Dence is not here, then I wonder if
22 we could surprise him and call on him first, because I
23 know he's here, Mr. Jeremy Stiles of the Environmental
24 Coalition of Prince Edward Island.

25



1 PRESENTATION BY MR. JEREMY STILES:

2 I would like to thank FEARO for making it
3 possible for islanders to have some input in this
4 process. My only regrets are that we were unable to
5 meet on Prince Edward Island. I'm making this
6 presentation today on behalf of the Environmental
7 Coalition of Prince Edward Island.

8 This issue is of particular concern to
9 islanders since the Maritime Electric Company Limited
10 has recently signed an agreement with New-Brunswick
11 Power to purchase 20MW of nuclear generated capacity
12 and energy each year for three (3) years, beginning in
13 the Fall of 1991. The agreement was approved by the
14 Public Utilities Commission of Prince Edward Island
15 this past summer.

16 Under the terms of the agreement, NB Power
17 will provide 20MW of capacity and energy from Point
18 Lepreau at NB Power's costs. These costs include
19 operations and maintenance, direct fuel and heavy water
20 costs, inventory carrying costs, capital related
21 charges, debt guarantee charges, decommissioning
22 charges and fuel adjustment charges.

23 Under the terms of the agreement MECL is
24 entitled to its proportionate share of the actual net
25 capacity and net energy output of Lepreau based on the



1 ratio that 20 MW represents of the units net operable
2 capability based on 635 MW or approximately 3%.

3 This agreement has Island rate payers
4 contributing substantial dollars directly to the
5 continued operation of the Point Lepreau facility.
6 Many Islanders are concerned that this agreement only
7 the first (1st) in a series that will ultimately result
8 in a much larger financial investment in Point Lepreau
9 II.

10 In light of the fact that Islanders are
11 now directly contributing to the coffers of the nuclear
12 industry in Canada, members of the Environmental
13 Coalition of Prince Edward Island have some concerns
14 regarding the disposal of high level radioactive wastes
15 in the shield and with this particular forum.

16 The panel's consideration of only the
17 abstract concept of deep geological disposal with no
18 reference to a specific site contradicts what many
19 Canadians have been asking for throughout the Green
20 Plan hearings.

21 That is that a more holistic approach must
22 be taken by governments in their approach to
23 Environmental Impact Assessments of proposals such as
24 this.

25 When the terms of reference are as



1 confined as these a full and comprehensive assessment
2 of the issues cannot hope to be obtained. This results
3 in a gross disservice to the Canadian public.

4 The recent decision against a fixed
5 crossing to Prince Edward Island is a classic example
6 of how assessing the abstract concept fails to satisfy
7 anyone.

8 Decisions about nuclear waste disposal
9 involve trade offs between the public's health and
10 environment and the health of the industry are
11 primarily moral and ethical. The Coalition believes
12 these decisions must be made by the public.

13 A report entitled the Eleventh Hour
14 published in 1988 unanimously recommended a moratorium
15 on the construction of nuclear power plants, until
16 Canadians have agreed on an acceptable solution.
17 Similar recommendations have been made by governments
18 in Ontario, England and California, the latter of these
19 has followed up with the appropriate legislation, i.e.
20 that is legislation that will not allow the
21 construction of any new nuclear plants until
22 satisfactory solution for disposal is in place.

23 In spite of this, it is of interest to
24 note that our Federal Government recently increased its
25 support for nuclear expansion in this country.



1 Nuclear wastes pose serious environmental
2 and economic problems. It is not appropriate to
3 isolate one part of the public concern for the release
4 of radioactive emissions into our biosphere from the
5 nuclear fuel chain, when as a society, we are concerned
6 about the cumulative impacts of all radioactive waste
7 products generated from the entire nuclear fuel cycle.

8 Clearly, the terms of reference that you
9 have been given do not enable you to adequately address
10 the concerns of the Canadians. I put it to the panel
11 that if you are unable to get the terms of reference
12 expanded to address some of the other concerns, then
13 you should resign.

14 The recent decision by AECSB to issue a
15 license to N.B. Power for the storage of high level
16 radioactive wastes on site, was a slap in the face to
17 my fellow Maritimers who voiced their concerns directly
18 to the AECSB.

19 The Environmental Coalition of P.E.I.
20 request that a full environmental impact assessment be
21 conducted on the storage of radioactive wastes in
22 concrete canisters above ground at the Lepreau site.

23 Dr. Timothy Binder, is the director of the
24 World Crisis Solutions Foundation, and publisher of
25 their newsletter. He suggests that the reduction of



1 ozone in the upper atmosphere is directly related to
2 the release of radiation from bomb tests and venting
3 nuclear power plants. He thinks that the radiation may
4 be changing the structure of oxygen in such a way that
5 it cannot make its normal change to ozone.

6 Dr. Binder visited the National Oceanic
7 and Atmospheric Administration in Boulder Colorado, and
8 spoke with a researcher named George Mount who told
9 him: "Yes, we know that radiation destroys ozone."

10 During the bomb tests in the 60's they
11 found a 2% reduction in ozone. The American government
12 is now reviewing the old data, this suggests to me that
13 they are reconsidering the nuclear connection to ozone
14 destruction. The question is, are they prepared to
15 tell the public about it now?

16 The importance about clarifying the
17 influence of radioactivity in our environment must be
18 made a high priority and the assessment of one link in
19 the chain does not adequately address the concerns of
20 Canadians. In order to put things into perspective re
21 the toxicity of these wastes, I will quote from a
22 conference held in 1986 in Manitoba.

23 Norm Rubin did the calculations for the
24 amount of water required to dilute to safe drinking
25 levels the amount of high level radioactive wastes



1 produced in three (3) years by the Darlington station.

2 According to his calculations, if the
3 wastes were dispersed, they have enough toxicity to
4 contaminate the water in all of the earth's freshwater
5 lakes to the point of undrinkability. This is three
6 (3) years production from one station.

7 Incidentally, according to Mr. Rubin, the
8 low level waste produced in one (1) year from the
9 uranium mine tailings produced for Darlington, if these
10 were dispersed into Lake Huron, they would be
11 sufficient to render that water undrinkable.

12 I think it's important that we don't skirt
13 the issue by referring to the total volume of these
14 wastes as being insignificant and keep in mind that the
15 toxicity and the longevity of these wastes.

16 Finally, it seems that the nation and in
17 turn the world, let loose a demon of unprecedented
18 virility and complexity when it released the atom from
19 the research labs. For forty (40) years, toxic wastes
20 have been thoughtlessly created with no safe long term
21 means of disposal. Nuclear wastes must be isolated
22 from the environment and actively maintained for their
23 entire life.

24 The Environmental Coalition of Prince
25 Edward Island believes that the cost of such



1 maintenance must be borne by the waste generators
2 themselves. Hastily conceived out of sight and out of
3 mind solutions are no solution at all.

4 It is highly doubtful that the nuclear
5 industry will be able to find a community willing to
6 accept a high level radioactive waste disposal site and
7 the government is not likely to win public support for
8 any solution which involves forcing a community to take
9 the waste against its will. Therefore, Atomic Energy
10 Canada Limited and the AECB should be making plans for
11 phasing out the nuclear industry in this county in
12 order to avoid creating any more high level or low
13 level nuclear wastes.

14 It's obvious that the AECB does not know
15 what they are doing and they are not doing a very good
16 job of not doing it. Thank you.

17 THE CHAIRMAN: Thank you Mr. Stiles.
18 Could I ask members of the panel if they have questions
19 they'd like to put to Mr. Stiles. Dr. LaPierre?

20 DR. LOUIS LAPIERRE: Mr. Stiles, thank you
21 very much for your presentation. At the end of page
22 one (1) of your presentation, you indicate that these
23 decisions must be made by the public.

24 Could you elaborate on that, what do you
25 really mean that the decisions should be made by the



1 public? How should they be made?

2 MR. JEREMY STILES: I think it's crucial
3 that the public be involved in the process. These
4 kinds of forums do tend to get some members of the
5 public involved, people who are already involved in the
6 movement, in the environmental movement, tend to make
7 efforts to be here.

8 But I think, beyond that, I think there
9 has to be a massive education campaign put out to make
10 people aware of the volumes and the toxicity and the
11 entire fuel cycle that's involved here. It's no good
12 to look at just one component of this. And then when
13 people are brought up to speed on the issue, they can
14 then formulate their own opinions on it. It's no good
15 for AECL or AECB to stand up there and blast off their
16 side of the issue and then for the environment movement
17 to come up and blast off its side of the issue and
18 leave the public in the middle like "who do I
19 believe?".

20 Because both sides tend to be a little
21 extreme. So I really believe that education has to
22 happen and then people, once they are informed should
23 be involved in the process. It's important that it's
24 not done hastily. I mean these things are going to be
25 around for hundreds of thousands of years and to put



1 them into an out of sight out of mind solution, which
2 seems to be the proposal, I think is wrong.

3 DR. LOUIS LAPIERRE: So do you have any -
4 -if not AECL and if not the groups which you represent,
5 who should do the education, public education?

6 MR. JEREMY STILES: I say both
7 organizations can do education but I think they need to
8 be working together to put the issues out and I think
9 the school systems, government, I mean it's a complex
10 process. It's very detailed and this type of forum
11 brings in certain types of people but the average Joe
12 on the street isn't that aware of it. So I mean
13 whatever it takes, I think people would have to sit
14 down and figure out what would be the best way of doing
15 it.

16 DR. LOUIS LAPIERRE: Thank you.

17 THE CHAIRMAN: Mr. Fyfe?

18 DR. WILLIAM FYFE: When P.E.I. decided,
19 signed this agreement, before that was signed, was
20 there much discussion of the possibility -- we've heard
21 this in many places, that those who use it, store it?

22 MR. JEREMY STILES: This issue was
23 discussed ten (10) years ago on P.E.I. when there was a
24 different government in, when the Lepreau was first
25 (1st) being built. And the government of the day made



1 the decision, made a recommendation to the P.U.C. not
2 to approve it. A proposal had been put forth and it
3 happened around the time of Three Mile Island.

4 And it resulted in election windfall for
5 the opposition at the time. The issue was thoroughly
6 flushed out then and the Premier who became then, was
7 very concerned about a catastrophe such as Three Mile
8 Island, wiping out the Island's economy because we are
9 responsible for the plant. I was totally taken aback
10 this past spring when the notice came out that NECL was
11 looking to purchase 20 MW. The Environmental Coalition
12 of Prince Edward Island acted as an intervener to the
13 PUC and made our views known.

14 Because of the amount of time allowed and
15 just the logistics of the process, and because the
16 Environmental Coalition is all volunteers, we didn't
17 have a lot of professionals that we could count on and
18 pay to put together our side of the story whereas NECL
19 had "Morinco", Montreal engineering Company, put its
20 side together and no doubt they were paid big bucks to
21 do it.

22 So we came in looking at the issues
23 strictly on the economics and conservation and the fact
24 that NECL was negligent ten (10) years ago for not
25 adopting a conservation program. So no, the actual



1 waste users should store the waste issue was not
2 brought up this past time.

3 THE CHAIRMAN: Madame Roy?

4 MS. LOUISE ROY: M. Style, vous avez
5 insisté sur l'importance -- you don't have a translator
6 with you -- Alors, vous avez insisté sur l'importance
7 de clarifier l'influence de la radioactivité sur
8 l'environnement global.

9 Est-ce que vous pourriez suggérer ou
10 identifier certaines études qui ont mis de l'avant une
11 approche reliée à l'évaluation des impacts cumulatifs
12 de la radioactivité sur l'environnement, ou identifier
13 certaines études ou certains chercheurs qui travaillent
14 dans ce sens?

15 MR. JEREMY STILES: Yes, I would be able
16 to do that but I wouldn't be able to do that right now.
17 It would be a matter of going back to Island and
18 speaking with some of my colleagues and sister
19 organizations across the country. And I'm quite
20 certain that we could come up with that.

21 MS. LOUISE ROY: Alors, est-ce qu'on peut
22 se fier sur vous pour nous acheminer ces informations
23 le plus tôt possible?

24 MR. JEREMY STILES: Certainly.

25 THE CHAIRMAN: It would be helpful to us



1 if you did that because that can become part of the
2 written record as I said earlier, it's the oral
3 presentations and various written submissions in a
4 number of occasions that we've gone along, we had asked
5 the participants if they could send us some
6 supplementary information which will add to the value
7 of what we've received at these meetings. So thank you
8 for that. Dr. LaPierre?

9 DR. LOUIS LAPIERRE: Just a small
10 question, the Environmental Coalition of Prince Edward
11 Island, is coalition of who and how big is your group?

12 MR. JEREMY STILES: The Environmental
13 Coalition, we basically adopted the name because the
14 name Coalition is kind of not accurate and that but the
15 Government recently formed a group that had the name
16 that we wanted to use.

17 So it is a coalition in one sense, the
18 structure of the organization in its bylaws, is set up
19 that we have two (2) executive coordinators and we have
20 committees that deal with the issues.

21 We have active committees in recycling,
22 education, energy, waste management, forestry,
23 pesticides, alternatives to pesticides. And we have
24 approximately two hundred (200) paid members in the
25 organization of a population of a hundred and thirty



1 thousand (130,000) a group that just began two (2)
2 years ago, I think we're doing alright.

3 THE CHAIRMAN: Mr. Van Vliet?

4 MR. PIETER VAN VLIET: Mr. Stiles, you
5 make reference to the fact that nuclear wastes must be
6 isolated from the environment and actively maintained
7 for their entire life.

8 Do you have any suggestions as to where
9 that might take place?

10 MR. JEREMY STILES: Well, I think it
11 should be above ground. I toured Pinewa or Lac
12 Dubonnet or the WhiteShell or whatever it was ten (10)
13 years ago, where ever the site was and my impression at
14 the time, the planning was you know, to put the stuff
15 underground and seal it and leave it and I mean that
16 thought just sent shutters up my spine that we would
17 actually entertain you know, this stuff is going to be
18 so toxic for so long, that we would actually entertain
19 the possibility of putting this stuff, thousands of
20 meters or feet or whatever it is, below the surface of
21 the earth and sealing it off and saying oh yes, well
22 it's taken care of now. I mean those plutons have been
23 stable for a billion years and they'll be stable for
24 another billion years.

25 It's got to be stored on the surface of



1 the ground and I don't think that these concrete
2 canisters at Point Lepreau are the answer either.

3 Again, I think that it's absolutely
4 imperative that the public be involved in the process
5 in whatever decision is made, beyond this level, at a
6 grass roots level, at a school level. I mean, you
7 just can't -- we're dealing with stuff that my -- I
8 mean how many generations do we go here, my children's
9 children's children's children's children's children's
10 children's children will be worried about their
11 children's children's children's children's children.

12 I mean anything that presupposes that you
13 can put it out of sight and it will be taken care of.
14 I read in doing research for this, I came across an old
15 proposal, an old concept that was to put in steel
16 cylinders, like bullets or something, the waste, the
17 high level waste, take it off the continental shelf
18 into these clays that lie on the bottom of the ocean, I
19 guess they cover two thirds of the ocean, drop it
20 through the clay and at the impact that it would be
21 travelling, would mean that when it went through the
22 clay from, you know, from the ship through the water,
23 would send it down, you know, a thousand meters or so
24 into the bottom of the ocean bed and the clay would
25 seal itself. That's how clay behaves, it heals itself.



1 I mean, that is ludicrous to assume that this thing is
2 -- the concept again of this, you know, let's put it
3 away somewhere and it will be taken care of and we
4 won't have to worry about it and that'll be it. I
5 mean, you've got to have it on the surface, people need
6 to know that it's there. I mean, pyramids would be
7 great. I mean you can walk in and out of it and people
8 will see great big pyramids with high level radioactive
9 waste in them and they'll know they're there right.
10 But anything that hides it, that hides it or conceals
11 it from the public.

12 MR. PIETER VAN VLIET: Should that be
13 located at the power stations themselves or anywhere
14 else in the near a community?

15 MR. JEREMY STILES: If it's anywhere else
16 then you get into the problems involving transporting
17 it and again you have to look at that, I mean, the
18 problem with the power stations is they're located next
19 to -- tend to be in highly densely populated areas but
20 I think it's imperative that we deal with what we have
21 and don't produce any more.

22 We can't, we can't adequately control
23 what's out there now and to continue creating high
24 level or low level radioactive wastes and releasing
25 them into our environment, that ludicrous.



1 MR. PIETER VAN VLIET: One more question
2 Mr. Stiles, you also mentioned that cost must be born
3 by the waste generators, do you mean the power
4 generators or the people that use the power?

5 MR. PIETER STILES: Yes, that's kind of
6 tricky, I thought of that as I was writing it. I mean
7 the companies, I mean the people, I mean Ontario Hydro
8 but ultimately, that'll get passed on to the consumer
9 which is unfortunate, but again if we deal with this,
10 the waste that's out there now and don't produce
11 anymore, then I think it might be easier to sell.

12 THE CHAIRMAN: Any other questions from
13 panel members? If not, thank you very much indeed, we
14 do appreciate the fact that you've come here to make
15 your views known on behalf of your group in P.E.I.
16 Thanks very much.

17 ---Mr. Stiles withdraws

18 THE CHAIRMAN: If Mr. Dence has now
19 arrived, we'd like to hear from him and if he hasn't,
20 I'll give everybody a five (5) minute break for a cup
21 of coffee, including myself.

22 Is Mr. Dence here yet? He's expected at
23 09:45, I think he had another appointment. Let's just
24 pause for a minute to take a cup of coffee and then
25 we'll hear from Mr. Michael Dence of the Royal Society.



1 ---Recess taken

2 ---On resuming

3 THE CHAIRMAN: Ladies and gentlemen,
4 mesdames et messieurs, si on peut prendre les places,
5 on peut recommencer la séance de ce matin.

6 Could I call first please, on Miss Carol
7 Karamessines who has asked to speak to us this morning,
8 please.

9 PRESENTATION BY MISS CAROL KARAMESSINES:

10 Alright, I haven't come thinking I would,
11 but as I came through the door this morning, I heard
12 the panel talking about a future inquiry into the
13 alternatives in terms of generating electricity and I
14 wanted to make sure that someone from Montreal read
15 into the public record that the panel should be aware
16 and I was assured they actually are, but I just want to
17 have a citizen put this into the record.

18 That the terms of reference for such an
19 inquiry must include saving electricity through energy
20 efficiency programs and as an example of that, I want
21 to refer the panel for the Quebec context, to a study
22 done for the Grand Council of the Cree, which was
23 submitted to the Mai Parliamentary Commission on hydro
24 electric energy in Québec, called -- okay, I am sorry,
25 I didn't understand the concept.



1 The particular study is called, it would
2 be the "Complément technique to the mémoire", to that
3 May Parliamentary Commission.

4 And the appendices thereof which were
5 separate studies done by the Natural Resources Defense
6 Council in Washington D.C. and by William Marcus and
7 Ian Goodman of California and Boston, two (2) energy
8 consultants, these separate studies arrived at the same
9 conclusion, that if proper energy efficiency measures
10 were to be introduced into the Quebec context and given
11 certain other policy choices open to the Quebec
12 government, there would be no necessity for the new
13 mega projects until I think about 2015 or 2020. And
14 these were separate conclusions by these separate
15 energy consultants in the US. And one of the things
16 that was part of that policy decisions the Quebec
17 government would have to make, would be annulling the
18 export contracts to say New York.

19 And so then, you might wonder well what
20 would New York do. And with reference to that, there
21 was a study released at the beginning of this year
22 which was done for a New York governmental agency by
23 the Environmental Defense from Washington D.C., I
24 believe Peter Miller there, which put forward evidence
25 to indicate that one third of the energy, electrical



1 energy now used in New York State, now generated -- not
2 really generated because some of it is bought I guess
3 from NYPA but all the private utilities in New York
4 State, all of the energy that they give out to their
5 consumers, one third of that could be cut right away if
6 sixty-four (64) energy efficiency measures marketable
7 items, I think sixty-two (62) of the sixty-four (64)
8 are already on the market, were to be put in place and
9 used.

10 And that's really all I want to say that
11 we can't leave that out of the argument, of the debate.
12 We cannot leave out energy efficiency because these
13 mega projects are destructive. The alternative nuclear
14 is dreadful but so is hydro electric mega projects in
15 the wilderness area. Thank you.

16 THE CHAIRMAN: Don't leave for just a
17 moment please. Thank you for bringing that to our
18 attention. Although I think you're attending to bring
19 it more to the attention of the Review which we
20 understand is about to be formed.

21 Perhaps I could just mention to you that
22 the draft terms of reference for that review, had been
23 sent out recently for comment by a number of
24 environmental groups.

25 I just happen to know from a conversation



1 last night, that Gordon Edwards of the Canadian
2 Coalition for Nuclear Responsibility has, has that
3 draft and is intending to comment. You might like to
4 be in touch with him and feed your ideas back in that
5 way if you'd like to.

6 MS. CAROL KARAMESSINES: Thank you very
7 much, I know he's aware of these issues too.

8 THE CHAIRMAN: Yes, I'm quite sure he is
9 but you might like to speak to him, but thanks for
10 taking the trouble to bring this to our attention.

11 MS. CAROL KARAMESSINES: Thank you, thank
12 you very much, thank you.

13 ---Ms. Karamessines withdraws

14 THE CHAIRMAN: Right, thank you. I
15 understand that Mr. Don Wedge is here now and I wonder
16 if he would be good enough to come forward to make his
17 presentation to us.

18 PRESENTATION BY MR. DON WEDGE:

19 Thank you Mr. Chairman, panel. I too want
20 to bring you citizen input on this. I was a teenager
21 at a boy scout camp in 1945, in a remote part of
22 England, no radio, no phone, nothing and yet somehow,
23 the word got through that there had been an atomic
24 explosion of some sort. We couldn't believe it because
25 we'd been brought up to believe you couldn't split an



1 atom, you couldn't do anything with an atom.

2 I almost still don't want to believe it
3 because for all the good it's done, it brought an
4 incredible amount of harm and nuclear power holds not
5 only this great potential for generating energy but a
6 great potential for misusing it.

7 We have the military fears and incredibly,
8 we have these peaceful fears. The sense that no matter
9 what's done with the waste, it's still going to be a
10 problem centuries from now, a million years from now
11 perhaps.

12 Of course we've got to find a solution for
13 the waste the exists. But I'm fearful that in finding
14 that solution, we will create the support to go on.

15 What are we reading about as the world
16 faces the problem, I have a selection of pieces from
17 recent newspapers here, Pakistan wants to speed up,
18 Switzerland, Sweden pull out, moratorium in effect in
19 the United States on new constructions, and different
20 ways the world's looking at it, fearful that Canada
21 will look for its energy solution in restoring new
22 nuclear power or new projects with their dangers.

23 So one half of me wants to say I hope we
24 don't find a solution to the waste problem because that
25 will discourage the foolhardy from going on with new



1 projects.

2 But of course, we must find the solution.
3 We're all fearful of nuclear war and what that will do
4 or nuclear accidents and what they have done. And what
5 it is, a hundred and thirty thousand (130 000) people
6 I think was the last I saw, directly affected by
7 Chernobyl.

8 I'm worried that these probability or
9 possibility of burying nuclear waste in the shield will
10 take care of it in the relative short term but in the
11 long term, it seems to have the potential of an equally
12 great disaster to humans.

13 Once the waste has been buried there in
14 such a remote way I have a sense that it won't be easy
15 to monitor and if changes occur, which are unforeseen,
16 it will be very difficult to correct them and take
17 adjusting measures.

18 I understand the project is to be buried
19 very deep into hard rock but even so, I don't know how
20 anyone can be sure there won't be seepage and seepage
21 into the water system in a very fundamental way.

22 So, my fears are that there should be
23 developed a way of disposing what we have that is more
24 not visual but at least more easy to monitor and to
25 correct if it goes right.



1 And whatever we do, we should not continue
2 with the ongoing creation of this waste. We have no
3 right to decide the fate of people centuries and a
4 millennia from now just to suit our own convenience.

5 We have to be more wise and more worthy of
6 being human beings than to risk people so far into the
7 future just for our convenience. That's my view.

8 MR. CHAIRMAN: Thank you very for letting
9 us share those views with you Mr. Wedge, are there any
10 questions which any of the panel members wish to put to
11 our participant?

12 Thank you very much indeed for taking the
13 trouble to appear before us this morning Mr.
14 Wedge.

15 ---Mr. Wedge withdraws

16 THE CHAIRMAN: The next participant will
17 be from the Royal Society of Canada, Mr. Michael Dence
18 is here and two others from the Society. I wonder if
19 they would come forward and make the presentation, if
20 they're prepared to do that now.

21 DR. MICHAEL R. DENCE: One member is still
22 en route. I could begin the process by introducing our
23 presentation if you wish.

24 THE CHAIRMAN: Well perhaps you could --
25 you're expecting him momentarily are you not?



1 DR. MICHAEL R. DENCE: He's in a cab
2 somewhere, he's in a cab somewhere between here and the
3 university.

4 THE CHAIRMAN: It can't take him all that
5 long to get here then from the University. Perhaps we
6 could -- perhaps you could go ahead at least, tell us a
7 little bit about what you've done within the Royal
8 Society to bring together the views of the very wide
9 interest which you have there.

10 DR. MICHAEL R. DENCE: Perhaps one other
11 member could join us.

12 THE CHAIRMAN: Good, good. I could
13 suggest you could even say a word about the Royal
14 Society and particularly how you come at this problem
15 Mr. Dence, that would be quite helpful.

16 PRESENTATION BY DR. MICHAEL R. DENCE:

17 I'd be happy to Mr. Chairman. This
18 presentation has been prepared by a joint panel which
19 is drawn from the Royal Society of Canada and the
20 Canadian Academy of Engineering.

21 And Mr. Matich here is a fellow of the
22 Canadian Academy of Engineering, and will speak to the
23 issues that the panellists or the committee members
24 from that organization brought to the committee.

25 Dr. Robert Haynes who is the person who is



1 en route, is the Chair of this Committee. And the
2 other members of the committee were Dr. Ludwig who is a
3 Professor of Mathematics at the University of British
4 Columbia, who has worked on the statistics of
5 biological matters.

6 Dr. Grant Garven, who is Associate
7 Professor at Johns Hopkins University, who is a
8 Canadian geologist with expertise in hydrogeology.

9 Dr. Donald MacDonald is the other member
10 from the Academy of Engineering, an Engineer with
11 expertise in tunnelling and excavation process in
12 particular.

13 Dr. Denis Shaw from the University of
14 McMaster, who is a member of the Committee, Geochemist
15 with wide experience in trace element geochemistry and
16 the rocks of the Canadian shield in particular. The
17 evaluation of almost everything.

18 And the other member of the committee was
19 Dr. Vera Vikis-Freibergs, who is a Professor of
20 Psychology at the University of Montréal, with
21 expertise in experimental psychology,
22 psycholinguistics, psycho-pharmacology, et cetera.

23 I have a brief resume of the membership of
24 the committee and a few lines on the expertise of the
25 members.



1 In addition, I was assisting the Committee
2 in my capacity as Executive Director of the Royal
3 Society of Canada and we asked two (2) people to be
4 witnesses to the Committee to assist them in their
5 discussions.

6 One was Dr. John Fyles, the former Chief
7 Geologist of the Geological Survey of Canada and the
8 other was Dr. Les Shemilt of the department of Chemical
9 Engineering at McMaster University, of course who has
10 had a long experience with this particular task and
11 here's our Chairman.

12 ---Dr. Haynes joins the panel

13 While he's getting his coat off, I could
14 just say that the Committee met over a two (2) day
15 period in late October at Royal Society's offices in
16 Ottawa.

17 I could say that the Society and the
18 Academy of Engineering are the two bodies in Canada now
19 which act as National Academies in the arts, sciences
20 and engineering.

21 Combined membership at the moment is about
22 fourteen hundred (1400) and I think it's fair to say
23 that it includes many of the leaders in humanity,
24 social sciences, natural sciences and engineering in
25 Canada, across Canada. In both cases, members are



1 elected by votes of their peers in the appropriate
2 disciplines and fields. Both organization are non-
3 political and they're uncommitted on these issues and
4 take no particular point of view on any issue
5 controversial or otherwise.

6 But the way they operate is to set up a
7 Committee, in this case a joint committee and to ask
8 that Committee, having set up Committee by vote of the
9 council or board of the organization, they then ask for
10 that committee to deliberate. And then the council or
11 the board of the Academy receives the report and in
12 accepting it, testify that they are satisfied that the
13 standard of the work that's been done and it adheres to
14 the necessary levels of scholarship that the
15 Organizations expect but they do not necessarily
16 endorse the views put forward. Now in this case,
17 because of the time constraints, there's been no time
18 for either body to actually see what has been put to
19 you today so they will eventually see it.

20 The membership of both organizations will
21 see it and it's conceivable there will be an avalanche
22 of further material come to us and to you as a result.
23 But we will see what happens there.

24 We have put together a brief overview
25 which Dr. Haynes has been responsible for and he will



1 speak of that in a minute.

2 In addition, I do have material here
3 amounting to about fifteen (15) pages of view points
4 that have been written in by members of the Committee
5 following our meetings in October. Obviously the time
6 is not available to go through these in detail, but if
7 the discussion wishes to bring some of them up, I will
8 be happy to or Dr. Haynes or Mr. Matich will be happy
9 to put them to you as an indication of the style of the
10 topics that came up. Not all of them were during the
11 discussions. Once you set the wheels in motion, the
12 thoughts come and what we've received here are slightly
13 more mature thoughts than the ones in the discussion in
14 October.

15 But that process will undoubtedly continue
16 as well. Now I don't know whether Dr. Haynes has had
17 time to compose his thoughts and carry on.

18 DR. ROBERT H. HAYNES: Yes, thank you very
19 much.

20 THE CHAIRMAN: Could I first of all say by
21 all means, do draw on what your members, or members of
22 your Committee have said, but I hope you'll be good
23 enough to table that with us, leave a copy with the
24 secretariat of these, if you have no objections, of
25 those individual comments. I think that would be



1 useful for us to have as part of our record and to get
2 the opportunity for us to read, we members of the panel
3 to read it.

4 DR. MICHAEL R. DENCE: What I would like
5 to leave with you today sir, is the introductory
6 material.

7 THE CHAIRMAN: Yes.

8 DR. MICHAEL R. DENCE: Some of the
9 preliminary comments and I could leave of course these
10 unfinished you see, unsorted comment but I would like
11 to have the opportunity in the next few days of just
12 arranging them slightly more...

13 THE CHAIRMAN: Even better then send that
14 alone to us, is that the idea?

15 DR. MICHAEL R. DENCE: Yes.

16 THE CHAIRMAN: That's very good, that's
17 fine thank you. Could I then, could I ask Dr. Haynes
18 if he would take the mike then.

19 And we've been asked by the technicians
20 and interpreters to speak fairly closely into these
21 microphones, so it will be well picked up. Dr. Haynes.

22 PRESENTATION BY DR. ROBERT H. HAYNES:

23 Thank you very much, Mr. Chairman. It's a
24 pleasure for me to be able to speak to you and the
25 panel today regarding an issue which I consider to be



1 an extremely important one in Canada and more
2 particularly for the future.

3 Not just the immediate future but the very
4 long distant future. I think I should say at the
5 beginning, that I in fact, did serve for five (5)
6 years, as a member of the Technical Advisory Committee
7 on the Nuclear Fuel Waste Management Program. The
8 first five (5) years of its operation in fact and I
9 remember very vividly the first (1st) meeting and a
10 discussion that I had afterwards with some of my
11 colleagues who were on the committee. And I said to
12 one "it's incredible what we are doing. We are sitting
13 here and we're discussing issues and making
14 recommendations that could conceivably have effect not
15 just over the next thirty, forty, fifty, one hundred
16 years, but over what might be regarded as geological
17 time.

18 And so therefore, it's extremely important
19 to have some firm idea of what it is one is doing.
20 Then I said the only comparable situation that I could
21 recall would be the discussion and the calculations
22 that went into the explosion or ignition of the first
23 (1st) atomic bomb when a number of scientists thought
24 that perhaps the heats generated would be sufficient to
25 ignite the waters in the sea and the water vapour in



1 the atmosphere and then deep turn the earth into a
2 fireball.

3 And I said the person who did the
4 calculations that made it on the basis of which that
5 decision to explode the first bomb went ahead must
6 certainly have been a rather brave man. And to my
7 considerable surprise, a member of that Committee,
8 professor Maurice Price of the University of British
9 Columbia, one of the world's most distinguished
10 Theoretical Physicist, turned to me and said "Bob, he
11 said, I did that calculation."

12 And I said: "Maurice, I said you did that
13 calculation?" and he said "yes". And he said
14 "furthermore there is no problem. All you have to do
15 is to believe that the laws of physics are correct."
16 And so in a way, I think we are in that kind of
17 situation with respect to nuclear fuel waste management
18 that is to say there really is a very serious problem
19 which must be dealt with. However, if the laws of
20 physics are correct, I'm quite sure it can be dealt
21 with satisfactorily.

22 In view of my experience not only with the
23 Technical Advisory Committee but also with the Joint
24 Committee of the Royal Society and the Academy of
25 Engineering, I am very concerned that this discussion



1 does not become a forum for what I would call a
2 competing ideological positions. I think that's very
3 unfortunate because that rarely lends clarity or honesty
4 to any issue. You get obfuscation and posing by all
5 parties to such debates.

6 I think the reality of the situation is
7 that we do indeed have a problem, that exists at the
8 present time. There is spent nuclear fuel at various
9 nuclear power stations. That fuel has been sitting for
10 varying periods of time depending on its age and the
11 age of the station and it will, it possible for it to
12 continue sitting precisely where it is for a good
13 number of years into the future.

14 None the less, I think that it's desirable
15 to design some means of handling it that does not
16 require its permanent siting, where it is at the
17 present time.

18 So I think that would be my first (1st).
19 point as the Executive Secretary of our Society, Dr.
20 Dence has already indicated to you, the Royal Society
21 and the Academy of Engineering officially do not take
22 official positions on issues.

23 Therefore, I think it's particularly
24 important that this committee and those with whom are
25 discussing this issue, understand that we do not



1 represent either a pro-nuclear or an anti-nuclear
2 position.

3 However, the main point that I would make
4 is that it doesn't matter where you stand in that
5 particular and important socio-political debate, the
6 problem that we face is here and it will not go away.

7 So therefore I would hope that if this is
8 understood, then all Canadians, independently of
9 whether they think nuclear power is a good thing or a
10 bad thing, would be able to participate in helping
11 those involved and indeed the panel, your panel, to
12 come to some rational and sensible position with
13 respect to the environmental assessment of the program
14 proposed by AECL.

15 In the summary that has been presented to
16 you this morning, a number of points are made. The
17 first (1st) point and I think it's a very important
18 one, is that the Environmental Impact Statement should
19 be a review of the generic concept of deep geological
20 disposal of spent fuel bundles.

21 It is not a normal Environmental Impact
22 Statement. The environmental impact studies that I
23 have been party to or have read in the past, if my
24 memory is correct, would all refer to specific sites.

25 Specific places where something was



1 proposed to be done. Where in this case, one is
2 looking at or reviewing or trying to review the
3 environmental impact of an idea or a concept as
4 presented by AECL.

5 Now of course, the concept is not entirely
6 devoid of some degree of site specificity. The concept
7 for example, does not entail the depositing of nuclear
8 fuel bundles in the mid-ocean trenches in the
9 expectation that they would ultimately be displaced
10 into the magma, into the lower depths of the earth.
11 Rather it is a proposal in which the disposal site
12 would be located in a particular geological area,
13 though a very large one. That is to say within the
14 Canadian shield precambrian rock formations, a very
15 large area.

16 But the important point is that there is
17 no specific site as yet chosen within that area for the
18 purposes of discussion.

19 So this makes, this -- the fact that what
20 you are being asked to review is a generic concept
21 rather than a specific site, I think makes the whole
22 issue much more interesting and perhaps, some ways,
23 perhaps simpler I think, and in other ways, perhaps
24 more complex than a normal Environmental Impact
25 Statement.



1 So that really is the first (1st) point.

2 The second point that we make in the overview is that,
3 it's by no means clear to us, whether the questions
4 that we have proposed and which will be proposed in
5 more detail in the document that will be submitted to
6 you next week I trust, it's by no means clear to us in
7 all cases, whether the questions that we propose for
8 consideration by your panel, fall within its official
9 terms of reference or are appropriate or are indeed
10 even appropriate for inclusion in the EIS which you
11 must ask Atomic Energy of Canada Limited to prepare.

12 Related to this also is another point and
13 that is that insofar as I personally know, and I think
14 this would -- this degree of ignorance would have
15 affected the other members of our joint committee, it
16 would appear to us that no Environmental Impact
17 Statement for a generic concept of this kind has ever
18 been requested by any other governmental organization,
19 either in Canada or abroad. And thus, it's going to be
20 up to the panel to make use of all the information and
21 suggestions available to it, to fashion the terms of
22 reference for the document and in the hope that the
23 final document is credible and acceptable to experts in
24 the field, to regulatory agencies and I think, most
25 importantly, to the general public.



1 So I think that whatever you do with
2 respect to instructions with regard to the
3 Environmental Impact Statement, I think they should be
4 framed in such a way that the final report will have a
5 high level of credibility and acceptability to all of
6 the interested parties. And that's a very broad
7 spectrum when you consider that it ranges all the way
8 from technical experts through regulatory officials, to
9 the general public.

10 And indeed, it's the hope of our Joint
11 Committee that what we consider to be really a
12 pioneering effort in this regard, will indeed not only
13 satisfy Canadian needs and concerns but also will serve
14 as a guide or even perhaps a standard for similar
15 assessments that will be carried out in other
16 countries.

17 The next issue and which is really I think
18 one of the most basic issues that we discussed, relates
19 precisely to the scope of the Environmental Impact
20 Statement.

21 Now obviously, the scope of such a
22 statement could in principal, be either very broad and
23 address a wide range of socio-political as well as
24 technical issues, or it could be focused very narrowly
25 on technical matters only.



1 And it is the view of our Joint Committee
2 that the Environmental Impact Statement indeed must be
3 broad rather than narrow in scope and that even more
4 importantly, it must be written as far as possible in a
5 language for the lay public, if it is indeed to be
6 credible and acceptable to the diverse communities
7 concerned with the issue.

8 In particular FEARO and AECL, the Atomic
9 Energy Control Board and the federal and relevant
10 provincial governments must be prepared to deal with
11 the possibility that AECL's present concept or scenario
12 for deep geological disposal may indeed prove to be
13 technically acceptable but publicly unacceptable.
14 That possibility must be entertained in forming your
15 terms of reference. On the other hand, you cannot
16 logically rule out the possibility that it's publicly
17 acceptable but none the less it poses grave technical
18 or economic difficulties that perhaps would escape the
19 immediate notice of the public, of the interested
20 public.

21 However I think we concluded that we see
22 not need to address either of these two (2) possible
23 though unfortunate results with detailed contingency
24 plans. I think the main point would be for the panel
25 to have these possibilities at least in the backs of



1 their mind.

2 And so, we would then conclude that the
3 crucial point is that the Environmental Impact
4 Statement should be sufficiently broad in scope so that
5 Canadians can feel confident that all the important
6 issues have been addressed clearly, honestly and openly
7 without any hint of obfuscation and even more
8 importantly, without any hint of ideological bias with
9 respect to which side the group is on, with respect to
10 the continuing general debate over nuclear power.

11 The point is that the issue that is being
12 posed here has got nothing to do with the question of
13 whether we have nuclear power or we do not.

14 And so therefore there's a paragraph in
15 this summary report which I will just read out to you
16 because I think it's a very important one.

17 And that is that "the diverse problems of
18 nuclear fuel waste management are unlikely to be solved
19 either by some simple, inexpensive technological fix,
20 nor are they to be solved by closing down the nuclear
21 power industry."

22 The spent fuel bundles are sitting in
23 Pickering right now as we sit here. Thus the
24 Environmental Impact Statement should begin first with
25 a clear and explicit statement of the nature and



1 magnitude of the present problem, on the assumption,
2 first (1st) on two (2) assumptions, they should state
3 the magnitude of the problem on two (2) assumptions.

4 And they are extreme assumptions, but I
5 think it's important. The first (1st) assumption would
6 be to state the magnitude and nature of the problem on
7 the assumption that no new nuclear power stations will
8 be constructed and that all present stations will be
9 closed down at the end of their useful lifespan.

10 So then, the point is that if the entire
11 nuclear industry is closed down tomorrow, every plant
12 is decommissioned, then what is the nature and
13 magnitude of the problem. That's the problem at one
14 end of the spectrum.

15 However, the other end of the spectrum I
16 think it is the Environmental Impact Statement should
17 address the question of whether the present waste
18 management problem will become more severe either
19 quantitatively or qualitatively, on the assumption that
20 nuclear generating capacity is expanded to meet a much
21 higher proportion, say 90% of Canada's electricity
22 needs in the foreseeable future.

23 So the question then is, how does the
24 magnitude or nature of the present problem change if
25 the percentage of nuclear power generated in the



1 country, increases virtually to what is maximally
2 possible?

3 So they're two (2) extremes scenarios to
4 be sure, but I think that if the Environmental Impact
5 Statement works against this background, then it will
6 also aid to have a more realistic final judgment.

7 Well, in addition to defining the
8 magnitude of the present and possible future technical
9 problem of nuclear waste management, the issues of
10 greatest concern to the Joint Committee could be
11 classified under four (4) categories which we have
12 indicated here.

13 I'll just speak briefly to them and then
14 turn the microphone over to my colleague, Mr. Matich of
15 the Canadian Academy of Engineering for some more
16 specific technical commentary from the engineering
17 standpoint.

18 The basic issues, the most fundamental
19 issues that we raised indeed were for the most part
20 semantic in character. And this is an area where
21 semantics are extremely important. And I want to give
22 you an example of what we mean, if I can find the
23 material.

24 I do not have the precise material I see
25 that I wanted, however I do have sufficient material to



1 illustrate the point of semantics.

2 What I had and which I cannot, for the
3 moment find, were a couple of quotations describing the
4 overall objectives of the nuclear fuel waste management
5 program or programs...

6 Oh yes, I found one. First (1st), a
7 statement that is contained in what I believe is a
8 still not distributed or still restricted OECD
9 document.

10 And in the executive summary, there is a
11 sentence that reads as follows "Radioactive waste
12 disposal systems are designed to isolate the waste from
13 humans and the environment for the necessary times to
14 ensure that no potential future releases of radioactive
15 substances to the environment would constitute an
16 unacceptable risk."

17 There is a similar statement which is,
18 although the words are slightly different, in a recent
19 document produced for popular consumption by Atomic
20 Energy of Canada Limited.

21 Now that is a fair and honest statement.
22 However, there are semantic problems with it. And the
23 problems are that all of the words are essentially, all
24 of the words in that sentence are words from ordinary
25 English.



1 But in fact, they're being used in a
2 rather technical sense. And so therefore, it's this
3 kind of difficulty I feel, that creates a lot of the
4 problem and a lot of the argument that swirl around
5 this issue.

6 And so therefore, what we would urge is
7 that you request the AECL or those people who are
8 involved in the preparation of the Environmental Impact
9 Statement, to do the usual academic thing, which is to
10 define their terms. Now, I'm quite sure that they
11 would be expected to define technical terms, pieces of
12 technical jargon that would occur in the report. And
13 I'm sure there would be a glossary at the end that
14 would contain these definitions.

15 But I don't think that is nearly as
16 important as producing clear definitions of those words
17 that are words of ordinary English or ordinary French,
18 simply because these are the kinds of words that will
19 give difficulty and over which debate will emerge.

20 So secondly, I think it's important that
21 these explanations of the terms, first of all, of
22 course should themselves be in non-technical language,
23 but more importantly, they should be both exclusive and
24 inclusive.

25 And I'll try to make that clear in just a



1 minute with an example. That is to say the definitions
2 should define what is included in the understanding of
3 the word but also what is not included in the minds of
4 the writers. And one would hope that on this basis,
5 ambiguity would at least be minimized.

6 Now, thinking back to the sentence that I
7 just read to you from the OECB document, some of the
8 key words there, I'll just go through as follows and
9 I'm not going to go through them all, but I'll just do
10 this by way of example.

11 The first is the word environment. It
12 must be made completely clear what it is that one means
13 by environment. You can take any object, I could take
14 this glass of water, the environment of this glass of
15 water, in principle, is the entire rest of the
16 universe, going right out to the edge, if there is an
17 edge. Now the question is, what environment is
18 relevant to the impact of this glass of water that's
19 sitting here on the table. So that's the first point.
20 And furthermore, these environments in the parlance
21 used for example by Professors at our Faculty of
22 Environmental Studies at York University, environments
23 are not just physical or geological or astronomical
24 environments.

25 They are also climactic, they are



1 biological, they're psychological, they're economic,
2 they're social, they're religious, they're ideological
3 and so on. Indeed, one person has said environments
4 can even be supernatural. And I think that if you read
5 the magazines at the checkout counters in the
6 supermarkets today, you will quickly realize that the
7 supernatural environment is very much with us and it's
8 one that's of deep concern to a lot of people. So
9 therefore, I think that it's awfully important to be
10 very clear what one means by environment.

11 Now, if this report is going to have some
12 degree of public credibility, which obviously is the
13 object of the exercise, then I think it's abundantly
14 clear that the environment cannot be restricted to the
15 immediate physical, geological or even biological
16 environment of the waste disposal site.

17 But some account must be taken of the setting into
18 motion of this program on the psycho-social, economic,
19 ideological and so on environment of Canada and perhaps
20 even North America.

21 The second point of course is to
22 understand that these environments will change in
23 character with time. Over the time span that this site
24 will be in operation, it's by no means clear that we
25 will have the same kind of society as we do today in



1 Canada.

2 Or that we will necessarily have even the
3 same kind of geology. I'm sure professor Fyfe will
4 correct me. I know the precambrian rock is a very
5 ancient and very stable formation. It is said to have
6 a low level of seismic activity. But I believe a low
7 level does not mean a zero level. And so therefore,
8 it's rather difficult to predict even what the
9 geological environment might be in millennia ahead. So
10 that's an example of what I mean by definition. What
11 environments are to be considered.

12 Then, it's an Environmental Impact
13 Statement. What does one mean by impact or
14 consequences.

15 In general, one thinks of impacts or consequences as
16 being bad or undesirable. However, it's also possible
17 that there could be no impact at all. It's also
18 possible that impacts could even be good. If you
19 consider the psycho-social and economic environment, it
20 might well be that many people would consider that the
21 employment opportunities that would emerge from such a
22 program would be a good thing. And so therefore,
23 impacts can be good, bad or indifferent. And again, I
24 think it should be clearly stated what is meant by
25 that.



1 A word that was discussed most extensively
2 by the Committee, was the word disposal. And you see
3 it in the OECD report, radioactive waste disposal
4 systems.

5 Now, I think that in the current state of
6 science, it's abundantly clear that geosphere and the
7 biosphere are very closely interconnected and
8 interrelated. In fact I believe I've heard professor
9 Fyfe even say that the biosphere has had as great an
10 impact on the geosphere as have other forces that
11 emerged strictly from physical origin. So therefore,
12 the idea that one can somehow erect a barrier between
13 the geosphere and the biosphere might not in fact be
14 correct.

15 It depends on what one means by barrier and the degree
16 of its permeability. Under those circumstances, one
17 must ask what one means by disposal. Is it possible
18 that a better word would be displacement. In other
19 words, the radioactive waste is not being disposed of,
20 it is being displaced to another position, another
21 location in the geosphere/biosphere of which we are a
22 part. Now I think you will see from that example how
23 the issue becomes a rather different issue in character
24 just depending on what word you use.

25 A word that is frequently used is



1 permanent and indeed it has been an assumption of the
2 Program from the beginning that this would be a
3 permanent disposal site.

4 Now does one really mean forever? From
5 here to eternity? Does one really mean that the moment
6 the radioactive material is put down into the
7 depository site, the doors can be locked, the keys
8 thrown away and everyone just goes home and in a year
9 or two, the grass grows over the site and the trees
10 grow and people have totally forgotten that is even
11 there.

12 Now, that kind of scenario seems to emerge
13 from some of the language used in the work describing
14 this area. However, I'm by no means sure that's really
15 what is intended. So therefore I think that the use of
16 these words must be carefully defined. I have no
17 fundamental objection to the word disposal or permanent
18 in -- if they are clearly defined. But very often,
19 they are not defined and because they're plain words of
20 the English or French language, one can have problems
21 with them.

22 I will not go on to talk about this any
23 further. The issue of safety of course is a big one.

24 My wife is a lawyer and she has told me
25 that in the minds of many people, brought up in a legal



1 background, there is such a thing as safe or safety.
2 You know, "doctor, is your procedure safe?" and of
3 course, the reality is from a scientific point of view,
4 that in this valley of tears, nothing is safe. And so
5 therefore, I think it must be very clear how that word
6 safe and safety is being used so that the readers of
7 the Environmental Impact Statement will have a clear
8 idea of precisely what is intended when it is used.

9 Well I think that's enough on semantics.
10 I've just been trying to make a point.

11 The next point that I would make, relates
12 to the assumptions that have already been made within
13 the program itself. I would urge the Panel to look at
14 the forth annual report of the Technical Advisory
15 Committee on nuclear fuel waste management program,
16 issued in July 1983.

17 It happens in that report, there is an
18 appendix which lists all of the major decisions that
19 have already been made with respect to this program and
20 which of course, have affected the program development.

21 I think that it's desirable for the panel
22 and those who are involved in the Environmental Impact
23 Assessment or Review, to be explicitly knowledgeable
24 about these decisions and what the reasons were for
25 their being made. For example, in 1978, a decision was



1 confirmed that the reprocessing...

2 THE CHAIRMAN: Excuse me for interrupting,
3 but you have gone longer of the two limits which were
4 set for the Society.

5 DR. ROBERT H. HAYNES: Oh, I see, O.K.

6 THE CHAIRMAN: I don't want to cut you off
7 too much but I think we're all anxious to hear from
8 your colleague.

9 DR. ROBERT H. HAYNES: Yes, very well, I
10 will conclude then in a sentence, this will be all
11 spelled out in the subsequent document. We are
12 concerned that you look at the assumptions that already
13 underlie the program, for example, with respect to
14 reprocessing of the fuel bundles.

15 We would hope that radiological criteria
16 for the performance of the site be taken fully into
17 account and there are a number of statistical concerns
18 with regard of a technical nature which I won't go into
19 here, but which will be in the final report.

20 THE CHAIRMAN: Thank you very much indeed,
21 Dr. Haynes. I believe now, we could hear from Dr.
22 Matich on behalf of the particular viewpoint of the
23 Canadian Academy of Engineering.

24 PRESENTATION BY MR. M.A.J. MATICH:

25 Thank you Mr. Chairman, it's a pleasure



1 to make some comments on behalf of Dr. Don McDonald and
2 myself.

3 And I'd like to mention at the outset that
4 these are our views. They're not necessarily the views
5 of the Academy or of other members of the Academy as a
6 whole.

7 Some of the points I make have already
8 been discussed by Dr. Haynes and I'd like to read
9 quickly from a summary that I have, if I may. These
10 points are elaborated on, in greater detail in a
11 written memorandum which we have for distribution to
12 you. And following are some items and these are
13 strictly from an engineering point of view, which we
14 think AECL would be advised to include in the scope of
15 their Environmental Impact Statement.

16 Firstly, the matter of terminology which
17 Dr. Haynes has already addressed, we think is very
18 important. That all words and technical terms should
19 be clear, correct and unambiguous and consistent within
20 the scientific community and also readily
21 understandable by the public.

22 Secondly, with regard to the disposal
23 site, in the concept which is being assessed, the
24 disposal site comprises an underground repository in a
25 stable host bedrock as you've already heard.



1 It's understandable that AECL should
2 strive to find "an ideal site of this type", not
3 withstanding this worthy objective, the realities will
4 require than less than perfect site be utilized and if
5 so, AECL would be advised to demonstrate that such a
6 site can be upgraded to satisfy minimum acceptable
7 requirements.

8 AECL would also be advised to justify the
9 choice of this concept from the available variance of
10 the concept or the basically different concepts.

11 In regard to natural analogues, the
12 demonstrated attention given to the study of natural
13 analogues dealing with radioactive regimes in bedrock
14 is commendable and should be broaden to give a strong
15 emphasis as well to natural hydrogeological regimes in
16 other than a radioactive setting.

17 Fourthly with regard to risks, the AECL is
18 advised to give due consideration to all safety risks
19 as well as risks to the environment regardless of
20 probability or timing relative to closure.

21 Emphasis should be placed on ability to
22 manage risks in engineering works based on current
23 knowledge and future research, development and
24 performance assessment.

25 Regarding transportation of the spent



1 nuclear fuel, since transportation of used nuclear fuel
2 is one of the riskier parts of the concept, the Impact
3 Statement should demonstrate that attendant risks can
4 be safely managed in the Canadian environment.

5 As long transportation routes might be
6 perceived to imply greater risks of accidents, AECL
7 would be advised to justify the choice of a disposal
8 site or sites distant from the sources of spent nuclear
9 fuel.

10 I'd like to make some comments regarding a
11 pilot plant stage as follows, that there's a long
12 history of successful precedent in industry for the use
13 of a pilot plant stage in the scaling up of major new
14 processes to full scale operation. AECL would be
15 advise to give serious consideration to the use of this
16 procedure wherever possible in developing the concept,
17 including the maximum use of the pre-closure phase for
18 this purpose. In this regard, optimum use should be
19 made of full scale testing of components of the
20 disposal system under conditions representative of
21 final conditions on re-establishment of the ground
22 water regime and the post-closure stage.

23 Full use of "accelerated testing"
24 techniques should be made where appropriate.

25 In respect of permanent monitoring, it's



1 appreciated that the objective of developing a disposal
2 system that does not rely on surveillance and
3 monitoring in the post-closure phase is commendable.
4 However, it is believed that the concept would be
5 enhanced by comprehensive monitoring and surveillance
6 program in the post-closure stage at least to the point
7 where the results of the program indicate that it can
8 be reduced or discontinued with assurance. This would
9 have benefits to future generations.

10 Contingency plans, without implying
11 deficiencies in the concept, the latter must include
12 the provision of contingency plans which would
13 demonstrate capability to manage and correct in a
14 timely manner, all situations where unfavourable
15 departures from expected performance are encountered
16 and also take advantage of situations which are more
17 favourable than planned.

18 And nine, subsequent reversal of a
19 decision, it would be advisable to explain in detail
20 the role of major decisions in the development of the
21 concept as well as the implications of subsequent
22 reversals of these major decisions.

23 An example of this would be a decision to
24 reprocess the spent fuel at a date subsequent to the
25 start up of the pre-closure stage.



1 Those are some of our comments Mr.
2 Chairman, in a summary form. Thank you.

3 THE CHAIRMAN: Speaking for myself and I
4 suspect members of the panel as well, you have both
5 given us a great deal of food for thought, which we'll
6 try -- we've certainly benefited from right now.

7 And we will all look forward to reading in
8 more detail the presentation which will be along to us
9 soon, the written presentation which will support what
10 you've said here.

11 However, I would like to take advantage of
12 your presence to ask whether there are questions which
13 even at this time, before we've had the chance to see
14 your written material, any member of the panel might
15 wish to put to you. Madame Roy?

16 MS. LOUISE ROY: Vous avez mentionné le
17 caractère particulier de l'évaluation...

18 THE CHAIRMAN: Do you have on the headset?

19 MS. LOUISE ROY: Ca va, oui?

20 DR. ROBERT H. HAYNES: Ca va!

21 MS. LOUISE ROY: Vous avez mentionné le
22 caractère particulier de l'évaluation que nous avons à
23 faire dans la mesure où cette évaluation doit porter
24 sur un concept.

25 Vous avez aussi soulevé les difficultés



1 méthodologiques reliées à ce type d'évaluation et le
2 caractère relativement novateur de cette approche.

3 Vous avez aussi mentionné la nécessité de
4 rendre l'évaluation crédible pour des publics
5 extrêmement diversifiés.

6 Je voudrais vous demander à partir de la
7 connaissance que vous avez de ces différents milieux,
8 scientifiques, le milieu scientifique, les différents
9 publics, le grand public, les groupes environnementaux,
10 les groupes sectoriels d'intervention dans notre
11 société et à partir de la connaissance que vous avez
12 aussi de leur mécanisme de réflexion et d'évaluation
13 des problèmes, est-ce que c'est possible et souhaitable
14 de regrouper dans un même canevas d'évaluation, un seul
15 canevas d'évaluation, qui soit satisfaisant pour chaque
16 milieu, les paramètres et les questions à couvrir ou si
17 nous ne devrions pas plutôt envisager par exemple de
18 procéder par étape, ou à partir d'une approche
19 pyramidale ou de quelque'autre approche qui soit
20 différente, d'un seul canevas global soumis une seule
21 fois et à partir duquel l'ensemble des études devront
22 être produites?

23 DR. ROBERT H. HAYNES: Yes, I think the
24 answer must be up to the Panel itself. I think your
25 suggestion of at least two (2) documents could be a



1 useful suggestion. Certainly, I think the important
2 point is that if there is one (1) document, let it be
3 what I would call a "plain language document".

4 However, if the regulatory agencies or the
5 scientific community, the engineering community as
6 opposed to the general public, express a desire for a
7 more technically constructed report, then I think a
8 second (2nd) document would perhaps be in order.

9 THE CHAIRMAN: Are there other questions?
10 Dr. Fyfe.

11 DR. WILLIAM FYFE: In your deliberations,
12 given the time constance of this problem etc, and the
13 fact that God knows who'll be living in Canada in five
14 hundred years...

15 DR. ROBERT HAYNES: Does She?

16 DR WILLIAM FYFE: ...and this has come up
17 in some of our -- from other people who've presented it
18 to us, should this whole process be regulated
19 internationally?

20 DR. ROBERT H. HAYNES: The Joint Committee
21 did not consider that possibility at all. It is my
22 understanding that the International Atomic Energy
23 Agency is very much involved with work in this area.

24 Whether or not the relevant governments or
25 operating authorities in Canada would be prepared to



1 delegate or give up that degree of what might be called
2 sovereignty, that seems to be a buzz word these days,
3 to international agency, is another matter.

4 My own personal view would be that I think
5 it would be very desirable for an international agency
6 to play some considerable role. However, I think the
7 basic question is the extent to which final
8 responsibility or what I would call sovereignty be
9 given up in this regard. The reason I say that is that
10 there is another example which I've had direct
11 experience with in the past year or two.

12 That concerns the international guidelines
13 prepared by the ICSU the International Council of
14 Scientific Unions, with respect to the granting of
15 visas by governments for scientists to attend meetings
16 in their country. For the Genetics Congress which was
17 held in Toronto in 1988, we requested the government to
18 -- and in line with the UCSU requirements to provide an
19 explicit written undertaking that visas would in fact,
20 be granted to all bona fide scientists who wished to
21 attend.

22 However, they declined to do this,
23 External Affairs declined to do this because they
24 simply did not want to, as it were, give up or abrogate
25 their authority in this matter.



1 So as an internationalist, I would hope
2 that we would go as far as possible in the direction of
3 international regulation and control but I think that
4 it's a political and legal question that perhaps is
5 beyond the competence of this Review.

6 THE CHAIRMAN: Dr. LaPierre?

7 DR. LOUIS LAPIERRE: My question is to
8 either Dr. Haynes or Dr. Dence. It relates to the
9 reliability of models. When you went through your
10 discussions, did you spend any time or some time
11 discussing the reliability of models to adequately
12 integrate the changes that might take place over the
13 time of the disposal processes ongoing, in order to
14 predict with any degree of certainty what would happen
15 in the long term future?

16 DR. MICHAEL R. DENCE: If I could respond
17 to that, certainly that matter was discussed and in the
18 written material that you will receive, there are two
19 (2) or three (3) of the Committee members have
20 addressed these particular problems.

21 They have a number of concerns about the
22 statistical methods used, the power of the statistics
23 that may be employed and the validity of models and
24 there's quite a large list of considerations which you
25 may wish to take into account.



1 So I don't think it would be appropriate
2 to spend time now to go through all of this languish
3 list of points, but I think you'll find them useful
4 food for thought and certainly, it's fair enough to say
5 that there's a high level of concern about the
6 validation of the methods used in computer modelling
7 and what is implied thereby.

8 DR. LOUIS LAPIERRE: Thank you very much.

9 THE CHAIRMAN: Mr. Van Vliet?

10 MR. PIETER VAN VLIET: I'm not sure who
11 might answer this but both Dr. Haynes and Mr. Matich
12 have indicated the issue of studying a generic concept
13 versus a site specific concept. In your opinion or
14 those of the members of your organizations, how far can
15 one go or is it valid to go to a generic concept
16 evaluation versus site specific in view of many
17 variances that could occur over a number of specific
18 locations? How valid is it for the evaluation of a
19 concept to be considered and express some opinion on
20 it?

21 DR. ROBERT H. HAYNES: That's really a
22 very difficult question to answer. If we had a site
23 specific proposal before us, the difficulties would be
24 equally grave in coming up with a credible and
25 believable Environmental Impact Statement.



1 However the difficulties would be
2 different from the difficulties that would be faced in
3 handling the issue at the generic level.

4 I tend to have in my mind a picture of a
5 spectrum that ranges from the outer extreme of complete
6 abstractness and generality, the most extreme kind of
7 generic concept on the one hand over to the other end
8 of the spectrum, which would be a totally site specific
9 proposal in which one knew the exact location in terms
10 of geography, the exact depth, you knew, you had a
11 complete geological and biological survey of the area
12 in hand.

13 And then, you make an environmental impact
14 statement, assessment rather. The reality of the
15 generic concept that we are being presented with is
16 that it is not at the generic end of the spectrum. It
17 could be a more abstract concept that's being
18 presented. So in short it's generic yes, but it's a
19 little bit in the direction of site specific because
20 there is at least explicit discussion of particular
21 types of rock formations, particular kinds of biologies
22 and particular kinds of human populations and so on. I
23 think that locating the position of this proposal on
24 the spectrum that would go, that would range from
25 complete generality to complete specificity, is



1 something that one should take account of.

2 Indeed, I think it would perhaps be wrong
3 to state that this is a completely generic concept as I
4 indicated, the concept could entail disposing of the
5 waste in the deep ocean trenches. Or putting it on
6 rocket ships and sending it to the moon.

7 But that is still a disposal concept but
8 the one we have is rather more specific. So, I think
9 that therefore that it will be important to make it
10 clear in the statement just how specific this generic
11 concept actually is. But I don't see a simple answer
12 to that at the present time.

13 MR. M.A.J. MATICH: I wonder Mr. Chairman,
14 if I might add a few comments in answer to that
15 question. We cover that point in some detail in the
16 written submission and in which we advise that AECL
17 should examine a number of matters relative to the so-
18 called ideal site even at this concept stage.

19 Defining the characteristics of the ideal
20 site for example, the likelihood of finding such a site
21 and the means available for correcting any site defects
22 and basically upgrading a site to meet minimum
23 acceptable standards.

24 The maximum deviation from the ideal site
25 that can be considered acceptable and demonstrate that



1 the field investigative techniques with suitable
2 capability including the underground research
3 laboratory, these techniques which are necessary for
4 complete characterization of a specific site, in
5 accordance with a concept will be available when
6 needed.

7 Some of these techniques will be quite
8 sophisticated and we think that even at this stage,
9 that point should be covered as well.

10 And we felt that AECL should also
11 demonstrate that it's considered alternatives which
12 reduce the requirements on bedrock quality in an ideal
13 site, stability over the long term and very low
14 hydraulic permeability for example, those qualities of
15 bedrock.

16 There are a number of other items that are
17 mentioned in the write up.

18 MR. PIETER VAN VLIET: One more question,
19 to what extent does the study of natural analogues
20 relate to the generic concept, is there a correlation
21 in your opinion, are they two different items or are
22 there things to be learned from that in terms of the
23 site specific location versus the generic concept?

24 DR. ROBERT H. HAYNES: I would like --
25 well I will give you my immediate reaction there. It



1 would seem to me that the study of the natural
2 analogues such as the Okla reactor in West Africa for
3 example, would be part of a kind of a confidence built
4 in measure.

5 I think, I would have to say that when I
6 first heard of that natural reactor, I was extremely
7 surprised. I'm no geologist, but it had never crossed
8 my mind that such a thing was even possible. And so
9 therefore, I think the great merit of studying natural
10 analogues, whether they be that or other kinds of
11 natural analogues for example, natural analogues might
12 provide insight into ground water flow and things of
13 that sort, I think that these are really very important
14 because they, as I say, in the context of confidence
15 building measures, but in terms of direct technical
16 relevance, I don't know. I really can't respond to
17 that. Perhaps Mr. Matich could do that.

18 MR. M.A.J. MATICH: Yes, I think that they
19 are important from a technical standpoint for both the
20 concept assessment and of course later, assessing a
21 specific site, not only in the confidence building
22 aspect but in the technical information that can be
23 derived from these analogues.

24 And in our report, we stress not only the
25 analogues which deal with radioactivity regimes but



1 those that deal with ground, the ground water
2 environment particularly situations where very slow or
3 stagnant ground water situations exist or where
4 recharge rather than discharge environments are
5 present.

6 THE CHAIRMAN: I wonder if I could put a
7 question, I think to Dr. Matich, and this to help us of
8 course in the formulation of our guidelines, the
9 wording of the guidelines is going to be extremely
10 important to make sure that we have comprehensively
11 covered what we expect to see in the Environmental
12 Impact Statement.

13 You made reference to the desirability of
14 looking at a pilot plant approach. I want to make sure
15 that I followed you correctly there, particularly so
16 that maximum use could be made during any pre-closure
17 stage, of testing our monitoring capacity and also of
18 testing the reliability of the various components of
19 the proposed system.

20 I think that's the way -- you may want to
21 elaborate on that, but then leading on to that, I
22 thought you said that you would recommend or ask that
23 AECL at least examine the matter of monitoring in the
24 post-closure period.

25 And if that is the case, monitoring over



1 more or less what period of time, and with what in
2 view, merely to see what is happening, to be able to
3 take corrective action if something has gone wrong,
4 eventually perhaps to retrieve should there be a change
5 in policy as to what one does with the irradiated fuel.

6 Could you just elaborate a little bit on
7 that part of what you were saying to help me make sure
8 that I understand well what you wish to convey?

9 MR. M.A.J. MATICH: Perhaps Mr. Chairman,
10 I could just read from the paragraph in our memorandum
11 on that particular point.

12 And if I could repeat that we appreciate
13 that the research that's being directed at a disposal
14 system that doesn't call for monitoring and
15 surveillance in the post-closure period is a very
16 commendable one because this is much more, much more
17 difficult objective than a system which relies on
18 surveillance and monitoring over the long term.

19 And well, the idea when the permanent
20 storage facility is completely filled after fifty (50)
21 to a hundred (100) years, the door to it can be closed,
22 the key thrown away and the operation forgotten is a
23 good objective to strive for. The thought that no
24 subsequent monitoring whatsoever would be needed is
25 just not credible. An extensive and elaborate



1 monitoring program will be required throughout the life
2 of the storing stage and thereafter for an extended
3 period. And we felt at least to the point where you
4 could reduce monitoring or discontinue it entirely with
5 assurance.

6 We are not able to say how long that
7 period might be. But we think this would be desirable
8 firstly to show how the facility is working, to verify
9 that it's not working in a harmful way or to establish
10 what needs to be done if it's not working as planned,
11 to provide operating information which can be used in
12 the design and construction of new facilities for the
13 same purpose if any are involved and to indicate when
14 intensive monitoring could reduced or discontinued
15 entirely with assurance.

16 THE CHAIRMAN: Thank you, that's helped
17 me. Dr. Haynes?

18 DR. ROBERT H. HAYNES: I would just like
19 to add to that the possibility, I don't know whether
20 AECL has ever considered this. The possibility of
21 actually doing a very small scale field test in which
22 one would simply take a very small amount of spent fuel
23 material, and deliberately place it in a rock formation
24 where there is a lot of ground water flow and just
25 measure, using radioactive tracer methods, the



1 distribution of the material.

2 This is not going to tell you a great deal
3 with respect to vault performance, but it might at
4 least tell you something with respect to the movement
5 of radioisotopes in the area.

6 This of course could be done at a level of
7 radioactivity that would pose zero threat to anything
8 but none the less, could be measured with sufficiently
9 sensitive equipment.

10 THE CHAIRMAN: Dr. LaPierre?

11 DR. LOUIS LAPIERRE: I guess my question
12 might go to Dr. Dence. Within your group, you
13 indicated there was someone in sociology, associated
14 with your group, have you considered the question of
15 inter-generational ethics and the ethics of passing on
16 to future generations the caring of waste which is
17 generated and used in one society, one generation?

18 DR. ROBERT H. HAYNES: With respect to the
19 work of this particular Joint Committee, the answer is
20 no. We simply did not have time to get into the area
21 of ethics at all.

22 However, the members did have available to
23 them, a report of a Swedish working group that dealt
24 explicitly with the ethics, or the ethical questions of
25 such programs. I can't remember if the specific issue



1 of inter-generational ethics was discussed but I think
2 this of course is an important one. The difficulty
3 though with such ethical discussions is that they often
4 can become self-justifying once the decision has been
5 made to go ahead with the program. That is to say, we
6 do have a problem, it must be solved somehow and it is
7 going to pose a problem for future generations. So
8 therefore, the issue is not much advanced by
9 philosophers making statements or assertions that it is
10 unethical to burden human generations with such
11 problems. We burden human generations, future
12 generations with problems all the time, just in terms
13 of genetic disease for example. So as I say, I think
14 that the Joint Committee was aware of the issues but
15 I'm not sure how much, how helpful the discussion is
16 going to be.

17 DR. MICHAEL R. DENCE: Could I just add
18 that I think it's implicit in some of the thoughts that
19 are in the documents that you'll receive in the sense
20 that the issues that have been discussed are the
21 meaning of the word disposal versus long term
22 management and so on, do imply the general sentiment in
23 the Committee that some form of long term "management"
24 or other concern about the site will probably be
25 required.



1 THE CHAIRMAN: Madame Roy?

2 MS. LOUISE ROY: Un peu dans la même
3 veine, est-ce que vous avez couvert d'une façon assez
4 spécifique, les enjeux socio-économiques reliés à
5 l'évaluation du concept lui-même, de telle sorte qu'on
6 puisse avoir des paramètres de référence?

7 DR. MICHAEL R. DENCE: Again, the
8 composition of the Committee and the time available
9 didn't allow an explicit development of that theme but
10 it was recognized as an important one and one that
11 certainly should be taken up.

12 MS. LOUISE ROY: Merci.

13 THE CHAIRMAN: If no further questions
14 from the Panel, I would like to thank you all very much
15 for your thoughtful presentation, to repeat that we
16 look forward to receiving the written version of what
17 you have put together.

18 And I can assure you that it will studied
19 most carefully by the panel and also by the Scientific
20 Review Group of eminent scientists who are assisting us
21 in this very difficult task. Thank you all very much
22 indeed for your presence here this morning.

23 ---Panel withdraws

24 THE CHAIRMAN: This completes the number
25 of people whom I'm aware of, who asked to speak to us



1 at this morning's session.

2 But if there is anyone else present who
3 would like to take advantage of our presence here to
4 speak to the subject, there is time available to do so.

5 If there is no such person, I must thank
6 you all very much for being present today, for
7 listening with us to the interesting presentations
8 we've heard and I thank particularly the several
9 participants who have gone to the trouble to sort their
10 thoughts out and present them to us.

11 Thank you very much indeed. We will
12 resume at two o'clock this afternoon. We have a very
13 small number of participants scheduled for this
14 afternoon at least, therefore to make sure that those
15 of you who are coming back are here at two o'clock
16 (2.00 p.m.), because I think it will not keep us all
17 afternoon.

18 Thank you very much indeed.

19 ---Luncheon recess taken at 11:30 a.m.

20 ---On resuming at 2:00 p.m.

21 THE CHAIRMAN: I wonder if you would take
22 your seats so that we can begin this afternoon session
23 of the Montreal version of the scoping meetings which
24 are being held by the Environmental Assessment Panel,
25 to review nuclear fuel waste management and disposal



1 concept.

2 The meeting will be conducted in both
3 English and French. You may present your views in
4 either language. There is simultaneous interpretation
5 and there are earphones to be picked up at the back of
6 the hall if you care to avail yourselves of that.

7 Could I introduce the members of the panel
8 who are with me today, at this session. At this end of
9 the table, to my right, Dr. William Fyfe who is from
10 London Ontario, Professor in the department of Geology
11 and Dean of the Faculty of Science at the University of
12 Western Ontario.

13 On my immediate right, madame Louise Roy,
14 an Environmental and public affairs Consultant living
15 here in Montreal. She is a former Vice-President of
16 the Quebec Public Hearing Board on the environment and
17 a member of the Canadian Environmental Assessment
18 Research Council.

19 To my immediate left, Dr. Louis LaPierre,
20 a Professor in the department of Biology at the
21 University of Moncton and Chairman of the Environmental
22 Council of New-Brunswick.

23 And to appear momentarily, as soon as he's
24 got his travel arrangements straightened out, Mr. Peter
25 Van Vliet from Regina, a Mechanical Engineer, who is



1 also a member of the Senat of the University of Regina.

2 My name is Blair Seaborn, I'm chairman of
3 the panel. I reside in Ottawa. I'm retired but I
4 served previously as deputy minister of the environment
5 and as Canadian Chairman of the International Joint
6 Commission.

7 Secretariat members here, Mr. Bob Greyell
8 at the table to the left of our main table and at the
9 back of the room, Ms. Susan Toller and Ms. Susan
10 Flanagan, all of whom are here to assist you in
11 whatever way they can in the course of this session.

12 The review is being conducted in
13 accordance with the federal Environmental Assessment
14 and Review Process, EARP.

15 The panel has been asked in part, to
16 examine the nuclear fuel waste management and disposal
17 concept, a proposal for permanent disposal of used
18 nuclear fuel, deep in the granitic rock of the Canadian
19 shield. This is a proposal from AECL.

20 Let me say a few words about the panel's
21 mandate. The terms of reference state that the panel
22 is to review the safety and acceptability of the AECL
23 concept for geological disposal of nuclear fuel waste
24 in Canada.

25 In addition to that, we shall examine a



1 broad range of nuclear fuel waste management issues
2 including long term management, transport, and
3 environmental, social and economic effects. We shall
4 look at approaches to nuclear fuel waste management and
5 disposal being developed elsewhere in the world.

6 Since site selection will not occur until
7 a disposal concept has been accepted as safe, the panel
8 will not consider any specific sites but will review
9 the potential availability of sites and the methodology
10 and criteria required for site selection.

11 I should also say a few words about what
12 is not in the panel's mandate and therefore will not be
13 addressed in this review.

14 The energy policies of Canada and the
15 provinces, the role of nuclear energy within these
16 policies including the construction, operation and
17 safety of new or existing nuclear power plants, fuel
18 reprocessing as an energy policy and the military
19 applications of nuclear technology.

20 I would like to make it quite clear
21 however that the members of this panel, are very much
22 aware of the broader concerns related to the use of
23 nuclear materials and the use of nuclear power for the
24 generation of electricity.

25 The panel has been urging a broader review



1 of the comparative environmental implications of the
2 various methods of generating electricity. I am
3 pleased to say the steps are now under way to get such
4 a Review started. The department of energy in Ottawa
5 has been in touch with provincial counterparts and with
6 a number of energy and environmental groups to seek
7 their reaction to some proposed terms of reference for
8 such a broader review. I hope that responses to that
9 request will come in quickly so that the review may be
10 started and under way in the not too distant future.

11 The purpose of these scoping meetings is
12 to allow participants to identify issues that need to
13 be addressed in the Environmental Impact Statement that
14 will be prepared by AECL.

15 The panel is not requesting the
16 presentation of opinions on the substance of the
17 disposal concept at this time. Public hearings will be
18 held later to discuss whether AECL's proposal is
19 acceptable.

20 Following these meetings, the panel will
21 prepare draft guidelines for the preparation of the
22 Environmental Impact Statement and will make those
23 draft guidelines available to the public for a period
24 of at least thirty (30) days for comment.

25 Once we have that comment in, we shall we



1 shall finalize the guidelines and convey them to AECL.

2 AECL is expected to take at least a year
3 to a year and a half ($1\frac{1}{2}$) to prepare its Environmental
4 Impact Statement and will then present it to this
5 Panel.

6 Once the Panel has satisfied itself that
7 the AECL has addressed satisfactorily all the items
8 identified in the guidelines, we will hold public
9 hearings. Participants will be asked to discuss the
10 acceptability of AECL's disposal concept in detail at
11 that state of the review. The panel will consider all
12 comments submitted to it and will at its final act,
13 prepare its report to the ministers of Environment and
14 of Energy, Mines and Resources.

15 I would ask that those who have registered
16 to speak attempt to summarize their concerns in fifteen
17 (15) minutes unless they have previously requested an
18 extension of an additional either five (5) or ten (10)
19 minutes.

20 We shall pay of course equal attention to
21 written and oral statements. The panel may ask
22 questions of clarification following each presentation.

23 Anyone who would like to make a
24 presentation to panel but is not yet registered may
25 speak to any of the members of the Panel's secretariat



1 in order to get themselves identified and on the list.

2 We shall be accepting written submissions
3 identifying issues and concerns until the end of this
4 month, up to and including November 30th, 1990.

5 We have two (2) people who had asked well
6 in advance to present their views at this afternoon's
7 session and they will be taken first (1st).

8 But I have had a special request that we
9 might have a pre-presentation, if I may put it that
10 way, from the Raging Grannies who will come back to
11 make their full presentation after we have heard from
12 first Mr. Robins and then Miss Judith Berlyn.

13 So if the singing Grannies would like to
14 give us their opening gambit now, we will be glad to
15 hear them.

16 SINGING PRESENTATION FROM THE RAGING GRANNIES.

17 THE CHAIRMAN: Thank you for the opener.
18 I will now call, if he feels he can follow that act, on
19 the first (1st) person inscribed to speak to us this
20 afternoon, Mr. Walter Robbins, Coalition pour la
21 Surveillance du Nucléaire.

22 Mr. Robbins, would you come forward to the
23 table here please, if you could.

24 PRESENTATION BY MR. WALTER ROBBINS:

25 I think we grandfathers are going to have



1 to organize ourselves in the same way!

2 Mr.Chairman, and members of the panel, my
3 name is Walter Robins, and I represent la Coalition
4 pour la Surveillance du Nucléaire, COSUN.

5 Before telling you about COSUN and my own
6 interest in this particular assessment, and before
7 raising the three (3) principal issues we have iden-
8 tified, I would like to make a statement for the
9 record.

10 On September 23rd 1988, federal Energy Mi-
11 nister Marcel Masse launch this assessment with the
12 following words, quote

13 "It will be one of the most important
14 environmental assessments ever undertaken
15 in this country and will provide an
16 essential foundation for future decisions
17 on energy policy."

18 Imposing words, for what? Over two (2) years later, is
19 proving to be one of the quietest, low-key, unnoticed
20 and unpublicized federal Environmental Assessment
21 Review Processes, EARP, ever undertaken in this
22 country.

23 Mr. Chairman and panel members, I suggest
24 to you that this silent EARP itself, is an issue that
25 you must address.



1 In view of the minister's statement, I
2 further suggest to you that if a significantly larger
3 segment of the Canadian public is not involved in this
4 particular assessment, than any conclusions and
5 recommendations resulting from this exercise must be
6 discarded as unrepresentative and invalid.

7 The terms of reference established for
8 this assessment are ridiculously narrow. The fate of
9 Canadian and perhaps world energy policy may well rest
10 in the outcome of this assessment.

11 Limitation of these terms of reference to
12 one segment of the nuclear fuel cycle is a cynical and
13 rather transparently self-serving act on the part of
14 AECL and the government of Canada.

15 COSUN is particularly upset by the light
16 and hurry up manner in which this Assessment is being
17 conducted.

18 FEARO has had over two (2) years to plan,
19 organize and administer this. Yet when the public is
20 asked to become involved, it has been given ridi-
21 culously short time frames for preparation. These
22 scoping meetings are a case in point. We want to know
23 why we have had no response to the personal letters
24 which were sent to each of you panel members, through
25 the FEARO office, requesting that the time frame for



1 the scoping phase be extended through the winter, to
2 provide adequate preparation time. Here's another copy
3 of that letter in which we also sharply criticise the
4 pitifully small amounts of intervenor funding made
5 available for this particular EARP. I would like to
6 give you these procedures. That ends my opening
7 statement.

8 Now the Coalition pour la Surveillance du
9 Nucléaire is based in Sherbrooke Québec, was formed
10 under the name of the Coalition CHUS, in the spring of
11 1988 to deal with questions and that were surrounding a
12 plan by Atomic Energy of Canada Limited, to place an
13 experimental nuclear reactor at the Sherbrooke
14 University Teaching Hospital. The Coalition identified
15 fundamental problems with that plan which was finally
16 discarded by the University Hospital Board of Directors
17 in December 1988.

18 At that time, the Coalition included over
19 thirty (30) specific organizations and thirty-six (36)
20 municipal governments, representing about thirty
21 thousand (30,000) people, including a representative
22 cross-section of regional, linguistic, cultural and
23 national backgrounds.

24 Most of these organizations and
25 individuals in the Coalition, are on what could be



1 called a standby basis, ready to jump in if the region
2 is ever again threatened by projects which potentially,
3 have major environmental consequences. Currently, some
4 of the Coalition organizations meet regularly as a
5 watchdog group. Thus, COSUN is still actively involved
6 in a variety of environmental and nuclear issues
7 including the James Bay II project, health and safety
8 problems at Gentilly II, Québec's only operating
9 nuclear reactor as well as this particular nuclear
10 waste issue.

11 During 1985, some of the people who later
12 became active in COSUN were directly involved in the
13 controversy over the efforts of the United-States
14 department of energy, nuclear waste management program,
15 to characterize and undertake research in various
16 Canadian shield rock formations located in Canadian
17 water sheds in Northern Vermont and elsewhere.

18 The US granite rock underground nuclear
19 waste research effort was finally discarded in 1986,
20 after the US heeded formal diplomatic protest by the
21 Government of Canada, under the present prime minister.

22 As for my own involvement, I'm a retired
23 human resource management consultant with senior public
24 administration experience with the US government, which
25 I served for twenty-two (22) years. I also served for



1 six (6) years as the senior management development
2 officer for the government of Manitoba. My wife and I
3 retired and moved to the Eastern Townships of Québec
4 just over two years ago.

5 As a former property owner in the rural
6 municipality of Lac Dubonnet Manitoba, I became di-
7 rectly involved with the nuclear waste issue in 1980.

8 I was one of the leaders of the Manitoba
9 Citizens Group, concerned citizens of Manitoba, which
10 successfully lobbied for the present Manitoba law, bill
11 28, prohibiting the permanent underground emplacement
12 of nuclear waste anywhere in that province.

13 During 1986, I was part of a coalition
14 which lead a successful Canadian effort to prevent the
15 US federal Department of Energy from characterizing and
16 researching several geological formations located in
17 Northern Minnesota, within the Winnipeg River, Hudson
18 Bay watershed. I received a personal letter of
19 appreciation from Minnesota governor Rudy Perpich for
20 my help in that situation.

21 In 1986, I testified before the
22 Parliamentary Standing Committee on environment and I'm
23 the author of the book "Getting the shaft, the radio-
24 active waste controversy in Manitoba", published by
25 Queenston House Winnipeg 1984. My association with



1 nuclear issues also includes, as part of my tour of
2 duty with the US government, two and one half years
3 (2½) as a member of the organization and personnel
4 division of the Headquarters, United States Atomic
5 Energy Commission, near Washington D.C.

6 Now, I'd like to raise three fundamental
7 regulatory type issues directly related to AECL's
8 proposal which COSUN believes should be addressed.

9 1: questions surrounding the legitimacy of
10 the concept assessment itself.

11 2: questions relating to this specific
12 EARP as it is being applied to the AECL's proposal.

13 3: questions concerning the credibility
14 of institutions involved with this proposal.

15 1: Questions surrounding the legitimacy
16 of the concept assessment itself. Variably, Atomic
17 Energy Control Act provides the government of Canada
18 with broad sweeping powers, does it allow for the
19 actual permanent disposal of any nuclear materials.
20 Question: can it be conclusively demonstrated that
21 those who framed that act, who are obviously concerned
22 with use and control of nuclear materials, had even
23 remotely considered the permanent disposal of these
24 materials? Under what authority did AECL proceed with
25 its research in the first place?



1 Do not the people of Canada through its
2 Parliamentary system, have the right to expect that
3 something as important as the disposition of irradiated
4 nuclear fuel, would be specifically sanctioned by an
5 act of parliament?

6 Are we to blindly accept the thesis that a
7 method for disposal of nuclear fuel waste can simply be
8 undertaken by administrative, decision making practices
9 in the absence of specific laws?

10 Did not the government of Canada
11 effectively reject this concept of underground burial
12 of high level radioactive waste in Cambrian shield
13 rock, when in 1986, it successfully engaged in formal
14 diplomatic efforts, to prevent the United States
15 government from characterizing and conducting research
16 in Cambrian shield rock in a number of northern states.
17 Has not our government already said that it has no
18 faith in such an undertaking?

19 2: Questions relating to this specific
20 EARP as it is being applied to AECL's proposal. Is
21 AECL misusing and abusing the environmental assessment
22 review process by having provided this panel with an
23 incomplete proposal? This question is critical when
24 examined in the light of the FEARO guidelines, an
25 official documentation of the EARP process. I refer



1 specifically to the conditions for public meetings as
2 outlined in FEARO's description of the characteristics
3 of public hearings.

4 I quote from the official government docu-
5 ment, the federal environmental assessment and review
6 process:

7 "A panel obviously needs technical and
8 scientific analysis from experts but it
9 also needs to hear from the people who
10 could be affected by the proposal,
11 particularly those who live near the
12 proposed site. Although an impact may not
13 appear significant to the experts, it may
14 be so for people living and working near
15 the site. Local residents may have
16 information and insights not available to
17 the outsider".

18 Further the report of this panel is to in-
19 clude a number of items not the least of which are:

20 "the characteristics of the proposed site
21 and impacted area",
22 ladies and gentlemen, that's part of your job.

23 So how can AECL's proposal meet these ob-
24 viously crucial considerations in the hearing process,
25 in the absence of a specific site and without



1 consultation with the affected local community? And is
2 not AECL's concept assessment proposal grossly
3 incomplete until and if it can deal with the above
4 stated requirements, by locating and characterizing and
5 researching an actual site, deemed to be potentially
6 suitable as an underground nuclear waste repository?
7 The FEARO hearing criteria are quite consistent with a
8 significant body of scientific opinion which holds that
9 the viability of the underground isolation theory
10 cannot be proved outside the parameters of a specific
11 site, identified for a potential repository use. This
12 is a critical issue. For example, the Union of
13 Concerned Scientists, recommend that in situ research
14 should:

15 "be performed only at sites deemed
16 potentially usable for full scale high
17 level nuclear waste repositories.
18 Because the suitability of a given site is
19 so highly dependent upon the particular
20 characteristics of that site, decisions to
21 develop a site should be willingly
22 abandoned if serious defects become
23 apparent at any stage of repository
24 development".

25 And that's just one of a number of



1 scientific organizations that have made this same
2 point. In the light of the above issue, should not
3 this panel now recommend the indefinite suspension of
4 this Environmental Assessment until such time as AECL
5 is able to provide a complete proposal, that is a
6 concept assessment that is based not just on generic
7 research and computer analysis, but on the missing but
8 essential step of characterization and research into a
9 potential nuclear waste site as well.

10 3: My last point. Questions concerning
11 the credibility of institutions involved with this
12 proposal.

13 Many questions can be raised about the in-
14 stitutional framework surrounding AECL's proposal as
15 well as the credibility of organizations that have
16 played a role in the efforts leading up to the proposal
17 before the panel. Following are some of the more
18 serious ones. Government of Canada. How could the
19 present Minister of Energy, be permitted to set the
20 terms of reference for this EARP and possibly be in a
21 position to pass judgment on this proposal, in the
22 light of his position as a member of parliament for
23 that portion of eastern Manitoba, in which AECL has a
24 complex of research facilities and major facilities for
25 this underground research program.



1 Has not the minister publicly
2 characterized himself as quote "AECL's friend in
3 Court"?

4 Is not even the term conflict of interest
5 too weak to describe the situation.

6 Atomic Energy Control Board. Did not the
7 Atomic Energy Control Board prejudge the results of
8 this EARP process by publishing its regulatory document
9 R-72, geological considerations and siting a repository
10 for underground disposal of high level radioactive
11 waste on September 21st, 1987?

12 How could any responsible control board of
13 the government of Canada prepare regulations for the
14 "siting of such a nuclear waste repository", years
15 before the Canadian public would have the opportunity
16 to examine and judge the underground isolation option
17 itself. Has AECEB also published contingency
18 regulations for all the other possible options, for
19 nuclear waste, that is long term on site storage, deep
20 sea bed, shooting it into space or whatever."

21 Atomic Energy of Canada Limited. How can
22 this crown corporation be taken seriously as a
23 reputable scientific body in the light of its perennial
24 prejudgments of its research results.

25 Perhaps the Winnipeg Free Press expressed



1 this point best in its October 12th, 1985 editorial,
2 which took AECL's then president James Donnelly to task
3 with these words:

4 "Mr. Donally should know better than to
5 announce results of a research program,
6 talking about this nuclear waste disposal
7 program, before such a program is
8 completed. By doing so, he invites the
9 criticism that Atomic Energy of Canada set
10 out to prove that underground storage of
11 radioactive waste was safe and it intends
12 to do exactly that."

13 That's Winnipeg Free Press. Is it
14 possible that AECL's conflict of interest, that is
15 marketing nuclear technology on the one hand and doing
16 the waste research on the other, has contributed to
17 these prejudgments?

18 How can a profit oriented organization
19 like AECL continue to spend public funds on its theo-
20 ries in the light of growing negative public response?

21 Has not its own commission public opinion
22 polls from 1978 to the present, conclusively de-
23 monstrated that the Canadian public does not want this
24 concept or the results that could stem from it?

25 Can you imagine responsible business



1 organizations continuing to force its agenda in this
2 manner over a twelve (12) year period in the light of
3 such obvious customer dissatisfaction?

4 Has not AECL cast doubt upon its own
5 credibility by not providing the scientific criteria
6 for what constitutes the best possible underground
7 nuclear waste repository site?

8 How does this jibe with AECL's public
9 relation statements to the effect that communities will
10 line up to bid for the economic benefits which would
11 supposedly accrue to the recipient of such a facility?
12 Is AECL providing this panel with a scientific concept
13 assessment or a prescription for a new job creation
14 program? Has not AECL exhibited an institutional pat-
15 tern of behaviour which ignores or down plays adverse
16 data relating to its concept. It has been said that in
17 science, every answer raises new questions. But you
18 would not know that from the media adds, which for
19 years have extolled the virtues of this concept.

20 Where is the down side? Should not this
21 Panel require that AECL develop a complete inventory of
22 each and every unanswered and partially answered
23 scientific question raised in all the scientific
24 studies conducted for this concept. I'd sure like to
25 see it.



1 Other agencies: during the years of this
2 concept assessment, ladies and gentlemen, why have
3 there not been any truly independent agencies oversee
4 the work of AECL on its own program? The Technical
5 Advisory Committee is a creature of AECL. AECL is
6 accountable to the federal Department of Energy, Mines
7 and Resources. AECB is also accountable to EMR.
8 Again, where were the independent agencies?

9 This concludes COSUN's presentation on
10 scoping issues relating to regulatory, legislative and
11 institutional concerns inherent in AECL's concept
12 assessment proposal. Thank you for listening.

13 THE CHAIRMAN: Thank you Mr. Robbins.
14 Could I ask if members of the Panel who would like to
15 put any questions of clarification, either clari-
16 fication or precision from Mr. Robbins, on the base of
17 this presentation which we've had from him? Mr. Van
18 Vliet?

19 MR. PIETER VAN VLIET: Mr. Robbins, I take
20 it from your comments that you're not particularly in
21 favour of an underground disposal?

22 MR. WALTER ROBBINS: Fair enough.

23 MR. PIETER VAN VLIET: That may be an
24 understatement. Do you have suggestions as to other
25 means of disposal that could be considered?



1 MR. WALTER ROBBINS: Well, I don't think
2 you can dispose Sir, of this in the dictionary sense of
3 the term. But I'm sure others have made that point.

4 I have a report from Dr. Arjin Macagionni,
5 who's with an international research firm and I've seen
6 other reports which are now, recent reports, now
7 suggesting that in view of the uncertainties involved
8 in underground isolation, it would be preferable to
9 maintain the high level nuclear waste at the site using
10 new technologies, and researching new technology into
11 dry storage techniques, more sophisticated monitoring
12 techniques.

13 Oh, this is going on actually, this sort
14 of effort as you no doubt, know well. And that al-
15 though it's hardly a permanent solution, I'd just like
16 to point out that the mere fact that we have a problem
17 here does not necessarily means that there's a
18 solution.

19 I know that's hard for many of us to
20 accept including myself, because as you know from my
21 background here, I was part of the institution that
22 helped develop this particular technology, although I'm
23 not a scientist but I worked closely with them and it's
24 hard to accept that. But I think some day, I still
25 have faith that there will be methods and techniques



1 developed to deal with these materials more effectively
2 than simply using the old, age old mankind "dump your
3 stuff in the ground" idea. I really do.

4 And I think that if we keep it above
5 ground, we monitor it, we get better at that technology
6 and as the reactors eventually have to go out of
7 commission, you know, many of them are probably going
8 to be moth balled, maybe the entire installation needs
9 to be moth balled and guarded, I don't know that.

10 But I really think that that would be
11 preferable to taking the risks of underground emplace-
12 ment particularly in highly water saturated conditions
13 as we have in the Cambrian shield.

14 I don't know if that answers -- that would
15 be, that would be my preference.

16 MR. PIETER VAN VLIET: O.K. thank you.

17 MR. WALTER ROBBINS: Yes.

18 THE CHAIRMAN: Madame Roy?

19 MS. LOUISE ROY: Monsieur Robbins, dans la
20 mesure où la question posée porterait uniquement sur
21 les déchets nucléaires actuels, est-ce que vous croyez
22 qu'il est nécessaire de faire un examen des différentes
23 alternatives de gestion de ces déchets, d'une part.

24 Et est-ce que c'est possible de le faire
25 séparément d'un examen de site potentiel, pour



1 appliquer cette technologie?

2 MR. WALTER ROBBINS: Pour appliquer cette
3 technologie?

4 MS. LOUISE ROY: Oui, au fond, ce que je
5 veux dire c'est est-ce que la réserve que vous avez
6 actuellement sur l'examen d'un concept sans qu'on sache
7 où le concept pourrait être appliqué, sans qu'il y ait
8 de site d'identifié, reste le même lorsqu'il s'agit de
9 gérer les déchets actuels seulement?

10 Est-ce que c'est nécessaire d'avoir un
11 examen des différentes alternatives de gestion des dé-
12 chets actuels et est-ce qu'on peut le faire sans que
13 déjà un site soit identifié pour les stocker, par
14 exemple?

15 MR. WALTER ROBBINS: Bonne question.
16 Malheureusement, je n'ai pas mon traducteur pour la
17 question, je pense vous dites some of the waste could
18 if I understood this, and you can clarify, some of the
19 waste could be dealt with the way it's been suggested
20 by the proposal.

21 MS. LOUISE ROY: I'll try to make it in
22 English but my English is not very good.

23 MR. WALTER ROBBINS: Better than my French
24 I suspect.

25 MS. LOUISE ROY: As far as the actual



1 wastes are concerned, do you feel a need to assess
2 different options to manage those wastes--

3 MR. WALTER ROBBINS: Ah, okay.

4 MS. LOUISE ROY: --separately than a site
5 selection assessment. So should we assess the options
6 first (1st) and then when the safety or the
7 acceptability of one or other options for managing
8 actual waste could have been set, go to a further step
9 and then try to make a site assessment?

10 MR. WALTER ROBBINS: No I...

11 MS. LOUISE ROY: No?

12 MR. WALTER ROBBINS: I think that if
13 you're going to use the underground isolation process
14 that it would be essential that the research -- I'm not
15 saying that generic research that has already happened
16 shouldn't happen. What I'm saying is that it's
17 incomplete until a specific site is selected. The
18 characteristics of that particular site are so crucial.

19 For example, at Yuca Mountain, Nevada,
20 which is a dry site essentially, they're very concerned
21 that three hundred feet (300) I believe, under that
22 site, there is an aquifer which over eons of time,
23 could possibly invade, intrude on the site.

24 So the specific site itself, is essential
25 to the completion of the research. That's why I say I



1 believe this panel is being given an incomplete,
2 incomplete proposal. Until you receive the data
3 concerning the specific site, all you have is part of
4 the story. I don't know, I hope that -- yes for this
5 option.

6 As far as other options go, certainly
7 there needs to be more research into above ground
8 storage, long term storage, possibly for hundreds of
9 years, before some other.

10 There needs to be more research into
11 transmutation which, right now, is not practical, al-
12 though in the future, it very well could be. It might,
13 you know, a hundred years from now, there might a
14 scientific breakthrough in that area, which permits
15 scientists to actually reduce the toxicity, reduce the
16 radioactivity of some of the more longer lived elements
17 and deal with them. So let's give time and science a
18 chance by doing that. I guess money becomes a problem
19 doesn't it. You can't obviously spend all your money
20 on fifty different options.

21 On the other hand, right here, we're
22 simply looking at one very restrictive option. We're
23 looking at just this type, just the granite rock and
24 the Canadian shield rock. And that's, you know, that's
25 rather restrictive. I know that AECL did some



1 preliminary analysis of some other options. But if you
2 read their early consulting reports, you will find that
3 those were dismissed almost out of hand. It was as if
4 well, we're going to put them down here on the report
5 just to satisfy someone but we're really going after
6 this rock.

7 But by the way, the rock was characterized
8 as solid rock in many of the news media reports and
9 even some of the official reports originally. And
10 later on, it was found that it certainly wasn't solid.
11 Major fracture zones in the underground research
12 laboratory etc, were not known at the time, at the
13 beginning of the drilling. But I'm making a speech
14 again, sorry, go ahead.

15 THE CHAIRMAN: Thank you then very much
16 Mr. Robbins for the presentation, also for your res-
17 ponse to the questions which we've put to you.

18 MR. WALTER ROBBINS: Well thank you very
19 much.

20 ---Mr. Robbins withdraws

21 THE CHAIRMAN: I'd like to call next on
22 Miss Judith Berlyn who will be speaking to us this
23 afternoon.

24 PRESENTATION BY MISS JUDITH BERLYN:

25 I'm not used to these, so tell me if I've



1 got it right. Thank you.

2 Good afternoon, my name is Judith Berlyn.
3 I'm a professional Librarian whose undergraduate work
4 was in philosophy. I'm a member of the Steering
5 Committee of the Canadian Peace Alliance, an umbrella
6 coalition of several hundred groups and Coordinator of
7 its Québec section.

8 I'm a member of the Ambassadors for
9 Disarmament Consultative Group and a member of the
10 Board of the Canadian Coalition to Nuclear
11 Responsibility.

12 I'm here not as a representative of any of
13 the public interest groups with which I work as a
14 volunteer, but as a concerned private citizen.

15 The questions I would like to see
16 addressed in the Environmental Impact Study of the
17 concept of disposing of nuclear fuel waste by burying
18 it in the Laurentian shield, are primarily questions of
19 ethics and of logic. As a background to such
20 questions, I'd like to briefly recall the words and
21 thoughts of three people much wiser than I.

22 First, Albert Einstein's famous words of
23 1946:

24 "The unleashed power of the atom has
25 changed everything, save our modes of



1 thinking and we thus drift toward
2 unparalleled catastrophe."

3 Next, words that were put in the mouth of
4 a cockroach called Archie, by author Don Marcus, in
5 1935, ten (10) years before the world started to ex-
6 perience to unleashed power of the atom. Archie the
7 cockroach lived in Marcus' office and would write
8 messages to him overnight by jumping from key to key
9 and the typewriter.

10 He addressed Don Marcus as "Boss". This
11 is one of his messages, exerted:

12 "Dear Boss, I was talking with an ant the
13 other day, and he handed me a lot of
14 gossip which ants the world around are
15 chewing amongst themselves. I pass it on
16 to you in the hope that you may relay it
17 to other human beings and hurt their
18 feelings with it. Here is what they are
19 saying: "It won't be long now, it won't
20 be long. Man is making deserts on the
21 earth. It won't be long now before man
22 will have used it up so that nothing but
23 ants and centipedes and scorpions can find
24 a living on it.

25 What man calls civilization always results



1 in deserts. Man is never on the square.
2 He uses up the fat and greenery of the
3 earth. Each generation wastes a little
4 more of the future with greed and lust for
5 riches. Men talk of money and industry,
6 of hard times and recoveries of finance
7 and economics. But the ants wait and the
8 scorpions wait. For while men talk, they
9 are making deserts all the time, getting
10 the world ready for the conquering ant
11 drought and erosion and desert, because
12 men cannot learn.

13 It won't be long now. It won't be long
14 till earth is barren as the moon. Dear
15 Boss, I relay this information without any
16 fear that humanity will take warning and
17 reform. Signed Archie".

18 The third bit of wisdom is contained in
19 Elie Loiselles's reflections on the biblical story of
20 Noa. I've not found this written but have heard him
21 talk about it twice (2) in Montreal during the 1980's.

22 Elie Loiselles points out that in Noa's
23 time, the only power that could destroy creation was
24 the power of God. This remained true until our own
25 century.



1 Now human beings also have the power to
2 destroy creation. And so we face the ultimate test of
3 free will. Because we have this power, we have to
4 chose whether or not to use it. We have to chose whe-
5 ther to save or to destroy creation.

6 I'm here as the daughter of a civil
7 Engineer who did pioneering work in prestressed
8 concrete, and who has seconded in 1943 to the American
9 government, to work on the Manhattan project. My
10 father was one of a group of engineers whose job it was
11 to design the waste containment facility at the bomb
12 plant, at Handford, Washington. I believe they did
13 their very best and the were the best in the West at
14 the time. And yet the waste storage tanks they
15 designed failed prematurely.

16 One of the problems of technology is that
17 it is impossible to design for forever. Yet forever
18 is, to all intents and purposes, what is required, what
19 is required of technology in this situation.

20 We want a guarantee that lasts virtually
21 forever, which cannot be given because sooner or later,
22 everything fails. This dilemma poses both ethical and
23 logical questions which I would like to see address in
24 the EIS.

25 I am here as a mother of three adult



1 children, two of whom have told me at different times
2 in the past, that they do not expect to live to be as
3 old as I am now.

4 Unable to say that this was foolish of
5 them, I felt compelled to become part of the process
6 that is creating the pressure that will change the kind
7 of political decisions which will be made in the
8 future.

9 I am also here as a beggar. As is
10 everybody else who comes before this Panel. The
11 process in which we are all engaged is designed to make
12 us beggars, because we have no control over it and no
13 real power with respect to it. If we had either of
14 these, we would have been consulted when the terms of
15 reference were being drawn up in the first place. So
16 we are participating in a process that is both an
17 opportunity and a trap. It provides an opportunity to
18 be heard but at the same time, it is a trap, because it
19 gives the appearance of consultation without the
20 participants having any input into the deliberations or
21 the decision making.

22 For this reason, I find the process to be
23 both inadequate and unacceptable. This in no way
24 reflects on the Panel, merely the process.

25 Now an observations about structure. The



1 purpose of this Review is to determine whether or not
2 the concept of disposing of nuclear fuel waste by
3 burying it five hundred (500) to a thousand (1 000)
4 meters deep in the Canadian shield is acceptable to
5 Canadians. Acceptable not only technologically and in
6 terms of safety but acceptable also in social,
7 political and economic terms. The Panel has augmented
8 its expertise by appointing a Science Review Group to
9 assess the safety and scientific acceptability of the
10 concept from a technological perspective.

11 I'm struck by the fact that there is no e-
12 quivalent Humanities Review Group HRG if you like, to
13 assess the ethical and logical acceptability of the
14 concept from a philosophical perspective.

15 It is precisely those aspects in the
16 question of acceptability that I would like to see AECL
17 address. And I would like it to address them according
18 to the precepts of situation ethics as propounded by
19 Joseph Fletcher and others as the new morality of the
20 1960's.

21 As I understand it, situation ethics holds
22 that all principles are relative to concrete situ-
23 ations. How to do the right thing depends on our
24 responsible estimate of the particular situation.
25 Situation ethics put people at the centre of concern



1 not things. Obligations is to persons, not to things
2 to subjects, not to objects. What is good derives from
3 the needs of people. The morality of an act is a
4 function of the overall context of the situation in
5 which it is performed.

6 The terms of reference of this Review
7 Panel are so narrow, that they preclude consideration
8 of the overall context of the situation they are to
9 assess. This is both unethical and illogical and also
10 unacceptable.

11 The terms of reference as they stand
12 preclude consideration of the possibility that approval
13 of the concept is very likely to have at least two
14 potentially disastrous consequences; namely:

15 1: that it will be tantamount to issuing
16 an unlimited license for the production of
17 radioactive waste.

18 And 2: that it will be an obvious
19 invitation to other country who are in the
20 same bind as we are, to ship their nuclear
21 waste to Canada for burial.

22 The likelihood of these consequences must
23 be considered by any serious EIS of the concept. It is
24 imperative that all the ethical, logical, sociological,
25 political and economic assumptions of the EIS be



1 clearly stated and the reasons for them given, so that
2 they may be readily known and judged.

3 To change our ways of thinking, to take
4 warning and reform, to chose to save creation. I have
5 no doubt that we have the capacity to do these things.

6 It remains to be seen whether or not we
7 have the Will. I'm glad of the opportunity to come
8 here and beg it of you, to help us find that will,
9 thank you very much.

10 THE CHAIRMAN: Thank you Ms. Berlyn for
11 that very thoughtful presentation which you've given to
12 us. Are there any questions which members of the panel
13 would like to put by way of clarification or do we find
14 the message very clear as presented by Ms. Berlyn? Dr.
15 LaPierre?

16 DR. LOUIS LAPIERRE: Thanks a lot Ms.
17 Berlyn for your presentation. To come back to your
18 comment on a Humanities Review Group, the Humanities
19 Review Group which you identified, would you have any
20 specific questions that you would want this group to
21 answer?

22 MS. JUDITH BERLYN: I'd be happy to draw
23 up a list.

24 DR. LOUIS LAPIERRE: You would. Well, I
25 think we'd appreciate obtaining such a list.



1 MS. JUDITH BERLYN: Fine, I will get it to
2 you by the 30th, is that it?

3 DR. LOUIS LAPIERRE: Thank you very much.

4 THE CHAIRMAN: That would be helpful, it's
5 quite apart whether or not we have Humanities Research
6 Group, you do have a Panel here and the panel is most
7 anxious to have comments such as these, particularly
8 ones which could be relevant to how we frame the
9 questions which we will be putting in turn to AECL
10 requiring them to answer and we'd like your thoughts on
11 that if you had a moment to put them to paper and send
12 them to us. Could you do that?

13 MS. JUDITH BERLYN: Yes.

14 THE CHAIRMAN: Any other questions from
15 members of the panel? Thank you very much indeed Ms.
16 Berlyn for that presentation and for your offer to
17 follow up with something in writing. We appreciate
18 that.

19 ---Ms. Berlyn withdraws

20 THE CHAIRMAN: I have next on the list,
21 that we've already had an introduction from them, a
22 presentation by Mrs. Gene Perrault on behalf of the
23 Raging Grannies, Mrs. Perrault?

24 PRESENTATION BY MRS. GENE PERRAULT:

25 Good afternoon, my name is Gene Perrault,



1 I'm here as a representative of the Montreal Raging
2 Grannies, which is a chapter of the National Peace
3 Group which originated in Victoria.

4 We understand that the scope of this
5 Review includes future steps to be taken in the manage-
6 ment of nuclear fuel wastes in Canada.

7 The scientific ring of the Raging Grannies
8 has done an exhaustive research in this area and we are
9 here today to announce the technological breakthrough
10 that cracks the nuclear wastes nut.

11 The Grannies concept has many advantages
12 over that of Atomic Energy of Canada. For one thing,
13 our technology is exportable. AECL's concept makes us
14 very angry, because it will only encourage other
15 countries to send their radioactive wastes over here.

16 Doubtless to be transported up the already
17 endangered Saint-Lawrence river. We would like the
18 Environmental Impact of that aspect of the
19 transportation problem addressed in the Environmental
20 Impact Study.

21 I will now unveil the Grannies technology
22 by reading radioactive road resurfacing. My assistant
23 here, should we stand up... alright.

24 First of all, we take the lid off one
25 container of asphalt and add, while holding our breath,



1 -- inhaling one micron of this material causes lung
2 cancer -- one quarter pinch of plutonium.

3 Pour in quickly before measuring cup
4 melts, one half cup of strontium, if strontium is
5 unavailable, cesium may be substituted.

6 Then mix well and spread evenly on road
7 surfaces and reapply once a millennium. The warranty
8 is that: guaranteed to glow in the dark, and be self-
9 defrosting for at least a thousand (1000) years.

10 Immediate benefits: improves visibility,
11 reduces accidents, eliminates the need for salting
12 roads and saves millions of dollars in snow removal.

13 And the long term benefits: discourages
14 the use of roads thereby reducing CO₂ emissions and
15 diminishing global warming.

16 Thank you that is our recipe and we have a
17 little song to finish off.

18 (SONG)

19 THE CHAIRMAN: Thank you to the Montreal
20 chapter. I take it that members of the panel don't
21 have questions to put to the message that's being
22 conveyed.

23 ---Ranging Grannies withdraw

24 THE CHAIRMAN: I call next please on Ms.
25 Anette Henricksa, I hope I have that Henricks or



1 Henricksa, who has asked to speak to us. Please come
2 forward.

3 PRESENTATION BY MS. ANETTE HENRICKSA:

4 When I came here yesterday evening, I had
5 no intentions of speaking. But there are some things
6 that I feel have not been addressed and I'd like to ad-
7 dress them.

8 The information, the ideas that I'm
9 presenting have grown out many years of work in the
10 Environmental Movement, in England, Canada and the
11 United States and based on conversations and dis-
12 cussions I've had with hundreds, maybe thousands of
13 people in that time. And, in all of those discussions,
14 one of the things that I've through feeling is, there
15 was a long, a deep malaise among the general public.

16 Albert Camus and I believe the book is
17 "The Accord", presented or dealt with the same feelings
18 of hopeless, helplessness, a moving towards abyss.

19 So this has left me with a deep feeling
20 and concern about the possible psychological effects of
21 the continued risk that the nuclear industry is placing
22 us in. It also raises questions about what effect this
23 has on the society as a whole. Doesn't it exacerbate
24 the social problems, does it lead to increase use of
25 drugs, just in order to deal with that reality. How



1 does it affect people's relationships to one another if
2 they feel that ten (10) years from now, they're not
3 going to be able to make it. How does it affect young
4 children, and girls and boys when they think of having
5 children.

6 The other question that raises for me is
7 why so many people, or why so few people actually are
8 actually involved in solving and dealing with the
9 problem, while they continue in their sort of every day
10 life, pretending that it's not happening except when
11 you start talking about it with them. And you know I
12 can only relate it to my own experience and when I was
13 a child, I used to think that adults had all the
14 answers. And when I grew up, I transferred that to a
15 belief that the experts have all the answers. Thus my
16 own personal, social responsibility was negated.

17 It was quite a difficult process for me to
18 realize that experts are fallible, and quite often base
19 their decisions on priorities that aren't necessarily
20 environmental and they do not take the well being of
21 human kind into account or not primarily. I'm not
22 saying that aren't concerned, I'm just saying it's not
23 their primary motivation for their decisions.

24 It's like, I see it like being on an
25 airplane and being told that this airplane is heading



1 for Nirvana. That after a while, I realize that cap-
2 tains don't know where Nirvana is, they've loss their
3 way and quite often, their idea of Nirvana is not my
4 idea of Nirvana.

5 So, the way I understand it is, as power
6 becomes increasingly centralized in the hands of
7 experts, and as we, as individuals, become increasingly
8 disempowered and penalized for refusing to conform to a
9 logic of the technocracy, we have reached a point in
10 this process in which the only responsibility imposed
11 on the individual is an economic responsibility.

12 All is defined by economic imperatives.
13 Thus anything that will guarantee an individual's abi-
14 lity to participate in the consumer/producer equation,
15 will find unquestioning acceptance with the general
16 public, no matter what the consequences.

17 Humans are judged and rewarded for their
18 values. Their youth value to the given order. That
19 doesn't mean to say I'm not under any circumstances
20 questioning the value of work. What I am questioning
21 is to what end that work is -- what's the end of that
22 work, where is that work going, what is the end result
23 of our work.

24 So therefore, I see a great need to look
25 at the alternatives and to visionville, to look at what



1 else we can do.

2 You know, it scares me when I hear any
3 alternatives are hydro or nuclear, there are other
4 alternatives. People have been working on them for
5 years. Unfortunately, they are marginalized and
6 they're not taken seriously and it's very difficult for
7 people to actualize those alternatives.

8 But in that process, knowing the environ-
9 mental problems that result from either nuclear or
10 hydro, their hopelessness grows. And in that
11 hopelessness, I think we've got to look at how that
12 affects our society and I'd like you to address that.

13 THE CHAIRMAN: Thank you, thank you Ms.
14 Henricksa. Any questions which anyone would like to
15 put after that presentation, I think you've given a
16 message of a very special sort to us. Dr. Fyfe?

17 DR. WILLIAM FYFE: Yes, I would like to
18 thank you for the presentation and I think you're
19 reinforcing what we've heard from many people.

20 We have a terrible problem with our educa-
21 tional structure, that people are frightened of
22 experts, we should not be, we've taught the kids to
23 read and write but not to understand the world they
24 live in.

25 THE CHAIRMAN: Thank you very much, Ms.



1 Henricksa for sharing your thoughts with us today.

2 ---Ms. Henricksa withdraws

3 THE CHAIRMAN: We heard this morning from
4 Mr. Don Wedge. He has asked if time permits, whether
5 he might have another very few minutes this afternoon,
6 to complete his thoughts.

7 He spoke very briefly, and he tells me he
8 was not feeling particularly well, physically. He's
9 feeling a little better now, and I said we could
10 probably fit him in and hear one or two more thoughts
11 that he wanted to convey to us. Mr. Wedge.

12 PRESENTATION BY MR. DON WEDGE:

13 Thank you very much Mr. Chairman and
14 Panel. I do indeed feel better now, I wasn't feeling
15 very well this morning, so thank you for the
16 opportunity to complete my thoughts.

17 I wanted to mention to you as a for
18 instance, a note of the Anatole Kroczenko who died age
19 52, on July 1, this year, in Seattle and he died
20 because he was a helicopter pilot who flew over the
21 Chernobyl reactor in the 1986 disaster there.

22 And I think he's a visual symbol of the
23 need to avoid any more martyrs of that sort in the
24 cause of peaceful energy. We really have to avoid that
25 kind of thing.



1 And it's the sort of thing of course
2 that's given, made nuclear into a kind of dirty word.
3 Dirty because I think it's potential for mass fast and
4 slow death, is unparalleled by any other fuel or
5 perhaps any other substance or any other mankind's
6 activities.

7 It really is devastating, a hundred and
8 twenty thousand (120 000) people became contaminated in
9 Kazakhstan in September this year following a nuclear
10 accident.

11 Six hundred and seventy thousand (670 000)
12 people, I've now got the figure, are being tracked as a
13 result of Chernobyl for possible bad effects. These
14 are enormous things and it's of course nothing compared
15 with nuclear war which is outside what we're talking
16 about.

17 But it's huge, peaceful use of something
18 that ought to be enhancing life, there's a very big
19 downside.

20 And I want to draw your attention and I
21 wonder whether this can be -- how you would include it
22 in your further stages, that the profit from the
23 building and the construction that we're talking about,
24 those of further nuclear plants and the disposal of
25 this terrible waste, those who advocate it and who



1 participate in it, have a tainted view. And I know the
2 Environment Process, the Assessment process is to
3 overcome that, but I don't think it does.

4 I think the average citizen's need is a
5 bit that one of the early Christians facing the lions.
6 We're not really heard by the Government and I instance
7 that, the exclusion of the military from your
8 concerns.

9 Military are enormous generators of
10 nuclear waste. And that should be momented directly or
11 indirectly. And it's also I think, other aspects of
12 this process, I've noticed listening, I don't think ten
13 thousand (10 000) years is enough.

14 The requirement should be for a process
15 that will be safe longer than that given the time that
16 it will take for certain of the components to
17 disintegrate. We've not heard enough about the
18 transport hazards. They're huge too. I've heard
19 almost nothing today about that.

20 Even given that, though, I'm most worried,
21 as I mentioned this morning, about the idea of the
22 construction of this size is one kilometre or more deep
23 into the rock and then, in this construction, at that
24 level or below, must weaken the structure that we just
25 cannot think of doing it in any area where there's even



1 possibility of seismological influence in the stress
2 itself, from a heat stress or anything else must be
3 awful.

4 I think that probably it is better to keep
5 it above ground. It's certainly not as close as it is
6 now to the nuclear power stations with the risk of
7 double, double accidents and double terror.

8 The temporary solution, the present
9 temporary solution is not a solution. I think maybe
10 there should be an interim solution to move it away
11 from present generating stations and so on into a
12 safer, a more remote area. There needs to be that
13 interim station.

14 Now the costs associated with all this
15 should not be met by in a general taxpayer way.
16 Somehow, the cost should be associated with the people,
17 the people who have benefited from these clean solu-
18 tions to our energy needs.

19 They may be one and the same person, I
20 know, but it should be presented in a way that it is,
21 that the cost of the cleanup is associated with the
22 benefits that we've enjoyed from cheap power -- cheap
23 was it?

24 It costs, I believe two billion dollars
25 for the Americans to get the first atom bomb worthy



1 something like twelve billion dollars in today's money.
2 We're talking similar amounts now, so we somehow have
3 to associate those costs with its use in people's minds
4 and in realities of costing.

5 I also wanted to mention the idea of an
6 international solution to this, the permanent solution
7 being international.

8 We find now that there's even there is
9 really really unsafe waste, nuclear waste in east
10 Europe and as the developing world gets its muscles,
11 it's being shown in the Middle East now, it is going to
12 want to use their muscles in many ways. One of them as
13 we know is nuclear ambitions, ambitions for nuclear
14 force but also ambitions for nuclear energy.

15 I have the distinct feeling that with the
16 progress made in the United Nations and other
17 international forum, at the moment, it could well
18 become an instrument for peace and an instrument for
19 world development, if together, we tackle the entire
20 problem of waste management.

21 The world is people talking about building
22 fifty (50) new plants a year to meet energy needs.
23 It's an horrendous thought.. We must avoid that, we
24 must avoid it even in our country. We must avoid it on
25 a world scale and find other solutions. We don't want



1 any more Anatole Kroczenko.

2 THE CHAIRMAN: Thank you Mr. Wedge, for
3 sharing with us those additional thoughts from what you
4 had to say this morning.

5 Are there any questions that anyone would
6 like to put to Mr. Wedge. Thank you very much, sir.

7 MR. DON WEDGE: Thank you.

8 ---Mr. Wedge withdraws

9 THE CHAIRMAN: Now, could I inquire
10 whether there is anyone else here who would like to ad-
11 dress us while we're still in Montreal, while the
12 panel's assembled.

13 If there is not, it remains only for me,
14 on behalf of the Panel, to thank you very much for
15 being present at our meetings here in this city and
16 particularly for those who have participated in a
17 variety of ways in our meetings. What you have had to
18 say will be very carefully noted by the members of the
19 Panel.

20 A lot of it also by members of our
21 Scientific Review group and I'm quite sure it will help
22 us in moving forward in what we must do to try to
23 address was is admittedly, a very difficult question.

24 Merci beaucoup d'avoir assisté aujourd'hui
25 et merci de participer si activement.



1 Bonjour et bonne fin de semaine.

2
3 --Whereupon the hearing was adjourned at 03.20 p.m. to
4 recommence at 7.00 p.m., Monday, November 19, 1990
5 in Regina.

6
7 I, YVAN G. LEMAY, the undersigned Official
8 Court Reporter, hereby certify the
9 foregoing is a true and faithful
10 transcript of this hearing taken by means
11 of stenomask.

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YVAN G. LEMAY,
Official Court Reporter

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D'EXAMEN DES EVALUATIONS
ENVIRONNEMENTALES

Held at/Auditions tenues au:
Regina Inn
Regina, Saskatchewan

Date: Monday, November 19, 1990
Lundi le 19 novembre 1990

Volume: 15

B E F O R E / D E V A N T :

MR. BLAIR SEABORN	CHAIRMAN
DR. LOIS WILSON	MEMBER
DR. LIONEL REESE	MEMBER
MR. PIETER VAN VLIET	MEMBER
DR. LOUIS LAPIERRE	MEMBER

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DE LA GESTION DES DECHETS
DE COMBUSTIBLES NUCLEAIRES

SCOPING MEETING
REUNIONS DE DETERMINATION DE L'IMPORTANCE DES PROBLEMES

Hearing held at the Regina Inn, Regina
Saskatchewan, on Monday, November 19, 1990,
commencing at 7:00 p.m.

VOLUME 15

B E F O R E :

MR. BLAIR SEABORN	Chairman
DR. LOIS WILSON	Member
DR. LIONEL REESE	Member
MR. PIETER VAN VLIET	Member
DR. LOUIS LAPIERRE	Member



(i)

A P P E A R A N C E S

MR. ROY HILL

CONCERNED CITIZEN AT
LARGE

DR. BRUCE COOK

ASSOCIATION OF
PROFESSIONAL ENGINEERS OF
SASKATCHEWAN

MS. TANNIS GOLDENSTEIN

PRIVATE CITIZEN

MS. MAISIE SHIELL

GRANDMA'S ENVIRONMENTAL
FUND

MR. AL TAYLOR

PRIVATE CITIZEN

MR. JAMES HARDING

INTERNATIONAL URANIUM
CONGRESS



(ii)

I N D E X o f P R O C E E D I N G S

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1 ---Upon commencing at 2:00 p.m.

2 THE CHAIRMAN: Good evening, ladies and
3 gentlemen. If you could take your seats we could start
4 this session and we start by welcoming you to this
5 Scoping Meeting being held in Regina by the
6 Environmental Assessment Panel, which is to review the
7 Nuclear Fuel Waste Management and Disposal Concept. The
8 Panel was appointed by the Minister of the Environment
9 in October of 1989.

10 Let me introduce the members of the Panel who
11 are with me here this evening. At my left, your right,
12 at that end of the table, Mr. Peter Van Vliet, of this
13 city, a mechanical engineer who is a member of the
14 Senate of the University of Regina.

15 Immediately to my left, Dr. Louis LaPierre,
16 from Moncton, a professor in the Department of Biology
17 at the University of Moncton, also Chairman of the
18 Environmental Council of New Brunswick.

19 To my immediate right is Dr. Lois Wilson of
20 Toronto, who is President of the World Council of
21 Churches and a Co-Director of the Ecumenical Forum of
22 Canada, and to her right again, Dr. Lionel Reese, from
23 London, Ontario, a physician at St. Joseph's Hospital in
24 that city and a professor in the Department of
25 Diagnostic Radiology and Nuclear Medicine at the



1 University of Western Ontario.

2 My name is Blair Seaborn. I'm Chairman of
3 the Panel and I reside in Ottawa. I'm retired from the
4 public service, but I served previously as Deputy
5 Minister of the Environment and Canadian Chairman of the
6 International Joint Commission.

7 The Members of the Secretariat, I would also
8 like to introduce. At the table here to the left of the
9 front table, Mr. Bob Greyell, who is Executive
10 Secretary, and at the back of the room, Ms. Susan Toller
11 and Ms. Susan Flanagan. All of them are available to
12 assist you in any way that they can during the evening.

13 The review is being conducted in accordance
14 with the Federal Environmental Assessment and Review
15 Process, EARP. This process ensures that the
16 environmental implications of proposals for which the
17 federal government has decision making authority are
18 fully considered as early in the planning process as
19 possible, and before irrevocable decisions are taken.

20 I hope that some of you may have had the
21 opportunity to receive information on this review
22 process and on the proposal of Atomic Energy of Canada
23 Ltd., AECL, at the open houses which were held in May
24 and June of this year.

25 The panel has been asked in part to examine



1 the nuclear fuel waste management and disposal concept,
2 a proposal for permanent disposal of used nuclear fuel
3 deep in the granitic rock of the Canadian Shield. This
4 proposal would see the used fuel sealed inside corrosion
5 resistant containers and placed in holes drilled in the
6 floor of a room inside a disposal vault. The vault
7 would in some ways resemble a deep mine and would
8 contain the used fuel in an area of approximately four
9 square kilometres.

10 I would like to say a few words about this
11 Panel's mandate. The terms of reference state that the
12 Panel is to review the safety and acceptability of the
13 concept for geological disposal of nuclear fuel wastes
14 in Canada. The one I just described as put forward by
15 Atomic Energy of Canada Ltd.

16 In addition to this AECL proposal, we shall
17 examine a broad range of nuclear fuel waste management
18 issues including long-term management, transport, and
19 environmental, social and economic effects. We shall
20 look at approaches to nuclear fuel waste management and
21 disposal being developed elsewhere in the world. Since
22 site selection will not occur until the disposal concept
23 has been accepted as safe, the Panel will not consider
24 any specific sites, but will review the potential
25 availability of sites and the methodology and criteria



1 required for their selection.

2 I'd like to say a few words about what is not
3 in the Panel's mandate and will not be addressed in this
4 review. The energy policies of Canada and the
5 provinces, the role of nuclear energy within these
6 policies, including the construction, operation and
7 safety of new or existing nuclear power plants, fuel
8 reprocessing as an energy policy, and military
9 applications of nuclear technology. These are excluded
10 from our mandate.

11 I would like to make it very clear, however,
12 that the members of the Panel are very much aware of the
13 broader concerns related to the use of nuclear materials
14 and the use of nuclear power for the generation of
15 electricity.

16 The Panel has been urging a broader review of
17 the comparative environmental implications of the
18 various methods of generating electricity. I'm pleased
19 to say that steps are well underway to get such a review
20 into motion.

21 The Federal Department of Energy has
22 written to its provincial counterparts, both energy and
23 environment departments, and to a large number of energy
24 and environmental interest groups, seeking their
25 opinions on some proposed draft terms of reference for



1 such a review, and they are now awaiting responses from
2 those various bodies consulted before moving ahead to
3 get the review underway, something which I hope will
4 take place before very long.

5 The purpose of scoping meetings such as these
6 is to allow participants to identify the issues that
7 need to be addressed in the environmental impact
8 statement that will be prepared by Atomic Energy of
9 Canada Ltd. The Panel is not requesting the
10 presentation of opinions on the substance of the
11 disposal concept at this time. Public hearings will be
12 held later to discuss whether AECL's proposal is
13 acceptable. Scoping meetings enable participants to
14 assist the Panel in identifying issues that are of
15 concern and questions which need answers.

16 Following this series of meetings, the Panel
17 will prepare draft guidelines for the preparation of the
18 environmental impact statement. We will invite public
19 comments on these draft guidelines over a period of at
20 least 30 days. After consideration of these comments,
21 the Panel will finalize the guidelines and issue them to
22 AECL. Once AECL has completed the environmental impact
23 statement, a process, I might say, which is likely to
24 take a year or a year and a half to do if it is to be a
25 complete environmental impact statement, and have



1 submitted it to the Panel, that document will be
2 available for at least a 90 day public review period.

3 To assist us in the evaluation of scientific
4 and technical matters, a scientific review group of
5 distinguished independent experts has been established
6 by the Panel to examine the safety and scientific
7 acceptability of AECL's disposal concept. A report of
8 their findings and recommendations will be submitted to
9 the Panel, who will distribute it also to the public.

10 Once the Panel has satisfied itself that AECL
11 has addressed satisfactorily all the items identified in
12 the guidelines, we will hold public hearings.
13 Participants will be asked then to discuss the
14 acceptability of AECL's disposal concept in detail. We
15 shall consider all the comments submitted and will, as
16 our final act, prepare a report to the Ministers of
17 Environment and of Energy, Mines and Resources.

18 The present scoping meetings will be
19 conducted according to the meeting procedures published
20 on August the 24th of this year. The Panel would
21 appreciate it if review participants would restrict
22 themselves to the identification of issues within the
23 Panel's mandate. I ask those registered to speak to
24 attempt to summarize their concerns in 15 minutes unless
25 they've previously requested an additional 10. The



1 Panel will pay equal attention to written and oral
2 statements.

3 Participants who have registered in advance
4 will be asked to present their views to the Panel and
5 the Panel may ask questions of clarification following
6 each presentation. If there is anyone here who would
7 like to make a presentation to the Panel and has not yet
8 registered, please speak to any members of the
9 Secretariat just to get your names on the list, and that
10 will be within the limits of the time available, but I'd
11 hope that we would be able to hear from you. We will
12 certainly do our best to accommodate any of those who
13 have registered even if they have registered quite late.

14 Court reporters will record the proceedings
15 of each meeting. Transcripts will be made available to
16 designated libraries. A compilation of written
17 submissions will also be available from the Federal
18 Environmental Assessment Review Office in Ottawa. We
19 shall accept written submissions identifying issues and
20 concerns until the end of this month, up to and
21 including, that is, November 30th 1990.

22 With this, by way of introduction, I would
23 like to call on the first participant for this evening,
24 Mr. Roy Hill. If Mr. Hill would come forward. Just
25 take a seat up here if you would and then it's possible



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1 for us to have dialogue with you and for you to be seen
2 also by the members of the public who are here.

3 MR. HILL: Can I begin? Just begin?

4 THE CHAIRMAN: You can go right ahead.

5 PRESENTATION BY MR. HILL:

6 Good evening, Mr. Chairman, Panel members and
7 interested persons. My name is Roy Hill. I've prepared
8 a written brief of my concerns and issues that I have
9 identified on AECL's nuclear fuel waste management and
10 disposal concept.

11 I am not against the use of nuclear energy
12 for peaceful applications. I am not a radical. I do
13 not represent any company or group. I would like to
14 believe that I partially represent the majority of the
15 uninformed Canadian public with respect to this
16 important subject.

17 I am concerned about human and environmental
18 exposure to nuclear waste. I do not know this technical
19 subject and I am unfamiliar with the ins and outs of the
20 nuclear industry. Therefore, I will read the document
21 which I have prepared and then I will be happy to answer
22 any questions as to the reasons of my written
23 statements.

24 A Canadian citizen's concerns regarding the
25 safe containment, handling, transportation and permanent



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1 storage and disposal of used nuclear fuel bundles from
2 Canadian based nuclear reactors.

3 This report contains my views, which may or
4 may not agree with AECL's nuclear fuel waste management
5 disposal concept. However, I believe that the
6 procedures described will minimize the following
7 concerns which I have as a member of the general public
8 at large.

9 A) A longer radiation decay time should be
10 allowed for fuel bundles when removed from the reactor.
11 A maximum radiation level should be established for a
12 used fuel bundle before it can be transported to a
13 disposal site. This will reduce danger to the public
14 and environment if something goes wrong during movement.

15 Two, a chemically inert, virtually
16 indestructible, waterproof, permanently sealed trackable
17 shipping and disposal container needs to be designed to
18 ensure used fuel bundle radiation stays shielded during
19 transportation, to prevent exposing humans to this
20 hazardous material.

21 The transportation criteria established must
22 prevent accidental spills of this radioactive material
23 and must also be guarded against terrorist attack. The
24 selected routes must be away from residential areas.
25 Local authorities along the routes must be pre-informed



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1 of shipments.

2 The permanent disposal sites selected should
3 be remote, existing underground uranium shaft mines deep
4 into the Canadian shield rock, such as Uranium City in
5 Northern Saskatchewan. This is far away from the
6 general public. This will minimize any chance of future
7 exposure to long lived radionuclides contained in the
8 used nuclear fuel bundles.

9 I believe more research efforts should be
10 employed to develop a recycling technology for used
11 nuclear fuel. This would reduce the need for extensive
12 disposal sites and would also reduce the need to
13 continue extensive uranium mining.

14 I believe better monitoring and release
15 standards should be established at northern uranium mill
16 mine sites for releasing liquid chemical process
17 tailings to the environment.

18 That is a statement of basically my concerns
19 and I have a detailed approach which I'll read now.

20 The following statements are my personal
21 views, which I believe will contribute and maintain the
22 public safety at large as well as minimize the negative
23 impacts on our national environment in Canada, with
24 respect to the long-term disposal and handling of the
25 used nuclear fuel from reactors to future disposal



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1 sites.

2 Continue existing practice at nuclear reactor
3 sites of cooling down the highly radioactive nuclear
4 fuel bundles upon removal from reactor calandria tubes
5 in water filled thick walled concrete tanks for a
6 minimum time of five years. The nuclear fuel will then
7 be a thousand times less radioactive so that it will be
8 less hazardous to move to dry interim storage. The
9 measured radioactive level of a used fuel bundle on
10 removal from reactor is so many rems. I don't know the
11 value of that. I would like to know.

12 Continue existing practice at reactor sites
13 of dry storage in thick walled concrete sealed above
14 ground canister tanks for a minimum of ten years or
15 until the natural decay of radioactivity level measures
16 so many rems of radiation emitted from an individual
17 used nuclear fuel bundle. At this stage at least 15
18 years after the fuel bundle was removed from the reactor
19 it is placed an in inert thick walled casket and filled
20 with bentonite prior to sealing the casket for
21 transporting to a remote Canadian shield underground
22 deep permanent storage disposal site, and the amount of
23 rems should be established by the Atomic Energy Control
24 Board of Canada.

25 Each used nuclear fuel bundle which has been



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1 selected for shipment to a remote disposal site shall
2 first be permanently sealed into a container of the
3 following specification: Graphite reinforced thick
4 walled rectangular concrete chemically inert casket
5 filled with bentonite to repel water ingress. Casket
6 lid shall fit air tight and be glued on to casket
7 compartment which shall be equipped with lift sling
8 pockets. The sealed casket will be capable of
9 withstanding impact loads of falling off a truck
10 travelling at 65 miles an hour without failure. It
11 shall be watertight and withstand compressive loads up
12 to so many tons per square inch as established by a
13 structural mine design engineer and accepted by AECB.
14 The casket will be equipped with a powerful radio
15 transmitter tuned to an individual frequency for
16 tracking from airplane or satellite. This transmitter
17 shall be embedded into the lid of the casket and will
18 continuously emit signal for up to two years. Each
19 casket must be serialized and clearly marked on all
20 sides with radioactive warning logo. It shall be dated
21 and marked as to reactor site origin and disposal site
22 destination. An emergency phone number will be marked
23 on all sides for control centre.

24 Once the caskets are ready for shipment the
25 following transportation criteria should be adopted to



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1 minimize accidental risk to the general population and
2 environment as a result of damage to casket, contents
3 and or terrorist attack during transport to remote
4 storage disposal site in the Canadian Shield.

5 A maximum of five caskets will be shipped at
6 a time by truck, train, ship or cargo plane. No other
7 shipments will be allowed until previous shipment safely
8 reaches its disposal site and is placed into underground
9 permanent storage. Each transport vehicle shall be
10 equipped with a crane.

11 Each shipment must have a pre-approved route
12 plan and schedule which will be registered with all EMO,
13 police, and provincial authorities four weeks in advance
14 of departure to disposal site.

15 Each shipment will be monitored as to
16 location every half hour on a 24 hour basis. Transport
17 carrier will be equipped with radio to report in to
18 manned 24 hour control surveillance centre.

19 Only day travel in good weather at posted
20 minimum travel speeds will be allowed. No winter
21 departures will be allowed.

22 The selected route must correspond to locally
23 approved all weather dangerous goods routes to bypass
24 residential areas.

25 Each shipment will be provided with an armed



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1 escort to resist any terrorist attack for the purposes
2 of obtaining the used nuclear fuel bundles. This
3 security force shall consist of advance and rear guard
4 vehicles with overhead and flanker helicopter gunships.
5 This security force will be in place on a 24 hour basis
6 and must contact the control centre every half hour. If
7 half hour report is not made an airborne army unit will
8 be dispatched to verify position and or defend recover
9 caskets with radioactive contents.

10 The uranium oxide contained in the used
11 nuclear fuel will naturally decay to safe radiation
12 levels within 500 years of disposal. However, the used
13 nuclear fuel also contains radionuclides such as
14 Iodine-129, Cesium-135, Technetium-99, and
15 Plutonium-239, which remain at hazardous radioactive
16 levels for hundreds of thousands of years. If these
17 radionuclides remain in an undissolved used nuclear fuel
18 bundle sealed in a casket deep underground, it is felt
19 by AECL research experts that there is little chance
20 that the high concentrations could escape via ground
21 water to the surface of the earth.

22 For any slim or remote possible chance of
23 escape into the atmospheric environment by these forever
24 deadly radionuclides, I believe that all used nuclear
25 fuel bundles should be permanently disposed in old



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1 remote underground existing uranium shaft mines in the
2 Canadian Shield, far away from the general population.
3 Such a mine can be found at Uranium City in Northern
4 Saskatchewan.

5 The technology developed by Atomic Energy of
6 Canada Ltd. for keep rock disposal vaults could be
7 employed in this old underground uranium mine. The
8 transportation costs would be greater, but the mine site
9 preparation costs would be less because the main down
10 shaft and tunnels are already in place, as well as
11 equipment, housing and other facilities which would
12 convert for use as a disposal site at Uranium City,
13 Saskatchewan.

14 Small vaults could be dug into tunnel walls
15 for permanent storage caskets then backfill with
16 bentonite clay to waterproof chamber and fill chamber
17 doorway with 10 foot thick steel reinforced concrete
18 plug to permanently seal in caskets containing
19 radioactive used fuel. Location plans shall be kept.

20 Year round security staff should be employed
21 as well as radiation leak detection monitoring and
22 reporting to central control centre daily. If radiation
23 leaks are detected within 50 years of initial disposal,
24 corrective technology must be developed and employed to
25 prevent/arrest further leakage.



1 As a tunnel section becomes congested with
2 side storage sealed chambers, the tunnel section can
3 also be backfilled with bentonite clay between 15 foot
4 thick reinforced concrete plugs every hundred feet to
5 permanently seal tunnel sections.

6 At some point in the distant future,
7 depending on nuclear reactor use and the amount of used
8 nuclear fuel to dispose of, a decision would need to be
9 made to either expand the existing mine tunnels or
10 retire and seal the original disposal site after
11 selecting another site in the remote Canadian north.

12 Retired equipment which is radioactively
13 contaminated from decommissioned nuclear reactor sites
14 could also follow the above steps for storage,
15 transportation and permanent disposal.

16 I believe greater emphasis should be put into
17 recycling technology for used nuclear fuel as an
18 alternative to permanent disposal of fuel bundles and
19 uranium mining. Apparently other countries, such as
20 France, are reprocessing their waste nuclear fuel. So
21 why can't we also begin to recycle our nuclear fuel
22 waste?

23 I also believe that better methods and
24 monitoring of liquid chemical tailings released into the
25 environment from uranium processing mills at mine sites



1 needs to be more closely scrutinized. There have been a
2 number of accidental releases of unknown quantities and
3 chemical composition to Northern Saskatchewan's lakes,
4 rivers and land. Tighter controls should be implemented
5 to reduce chemical wastes into the environment at these
6 northern uranium sites, mills and mines.

7 Thank you.

8 THE CHAIRMAN: Thanks very much, Mr. Hill.
9 You have done a very detailed presentation, particularly
10 on some of the more technical matters here. We will be
11 looking at that carefully.

12 Are there any questions which members of the
13 Panel would like to put to Mr. Hill? Questions of
14 clarification, precision, on that presentation?

15 Dr. Wilson.

16 DR. WILSON: Just on page 3 there, you
17 suggest if radiation leaks are detected within 50 years
18 of initial disposal corrective technology must be
19 developed. Why did you settle on 50 years? I mean it
20 could happen in a hundred years or a thousand.

21 MR. HILL: It could be five, it could be two,
22 it could be 25. I just said 50 'cause this is going to
23 last for hundreds of thousands of years anyway.

24 DR. WILSON: But are you suggesting it should
25 be checked once and then --



1 MR. HILL: No, continual. It should be a
2 daily leak check.

3 DR. WILSON: I just wondered about the 50
4 years.

5 MR. HILL: -I don't think we can put it in the
6 ground and forget about it.

7 THE CHAIRMAN: Any other questions?
8 Mr. Van Vliet.

9 MR. VAN VLIET: Mr. Hill, you indicate that
10 there are some radionuclides that are having a very long
11 half life and suggest some ways of disposing of them.
12 Have you any suggestions as to how that might be done?

13 MR. HILL: Exactly the way they're doing it.

14 MR. VAN VLIET: In terms of --

15 MR. HILL: You know, you can't deal with
16 these radionuclides as far as -- they're dangerous and
17 they're very hard to contain. So if they stay in the
18 fuel bundles undissolved they're perfectly safe.

19 MR. VAN VLIET: Thank you.

20 MR. HILL: But if they get out they're not
21 safe and we know from Chernobyl that Cesium-135 is in
22 Northern Labrador right now, in lichens that the caribou
23 are eating. So it's kind of dangerous stuff, and I call
24 it stuff because I don't know what it is.

25 MR. VAN VLIET: Thank you very much.



1 THE CHAIRMAN: I think there are no further
2 questions. It is a clear presentation. We hear what
3 you have to say. Thank you very much for taking the
4 trouble to present that to us, Mr. Hill.

5 ---Mr. Hill withdraws

6 THE CHAIRMAN: The next person I have on my
7 list was to have -- Harry Sabier, was to have spoken on
8 behalf of the Association of Professional Engineers of
9 Saskatchewan. I believe that the Association is now
10 asking if they could make their presentation in
11 Saskatoon. I just want to make sure that I'm not -- no?
12 They're here now. Good. If you're here now please come
13 forward.

14 Please proceed. I'm not quite sure of the
15 origins of that false rumour about your desire to
16 present in Saskatoon rather than here. We are delighted
17 you are with us tonight.

18 PRESENTATION BY DR. COOK:

19 Mr. Chairman, panel members, ladies and
20 gentlemen, my name is Bruce Cook. I'm president elect
21 of the Association of Professional Engineers and I'm
22 here to present the brief on behalf of the Association.

23 The Association of Professional Engineers of
24 Saskatchewan, representing its members, is making this
25 presentation to the Panel in recognition of its



1 responsibilities to ensure that the special knowledge of
2 its members is made available to participate in a debate
3 of particular concern to the public.

4 The Engineering Profession Act of 1930 is
5 administered by the Association of Professional
6 Engineers. The Association is governed by a council
7 comprised of both elected members and representatives
8 appointed by the Lieutenant Governor in Council.

9 The Association is the only body responsible
10 for assessing qualifications and regulating the
11 licensure of professional engineers in the province. As
12 such, it is the only engineering organization that
13 represents all professional engineers in Saskatchewan.

14 At the end of 1989, the Association had 2,641
15 active members. The registers also included 211
16 engineers in training, 187 life members and 504
17 non-resident licensees.

18 The profession of engineering provides the
19 knowledge which facilitates the translation of capital
20 into wealth producing assets. The engineering
21 profession is founded on the principles of a body of
22 knowledge, provision of service to protect the public,
23 maintenance of a closely scrutinized standard of
24 conduct, and exercise of authority given to it by the
25 public to regulate its practitioners.



1 By maintaining high entrance standards to the
2 profession, and by enforcing the Code of Ethics of the
3 profession, professional engineers have supervised the
4 investment of many billions of dollars to improve the
5 standard of living, the safety and the welfare of the
6 citizens of this province.

7 There is in this particular issue a major
8 challenge. High level radioactive wastes are
9 accumulating at reactor sites in Canada and the
10 challenge is to develop a concept for safe storage and
11 disposal of nuclear fuel wastes in a fashion that will
12 instill public acceptance and confidence.

13 We congratulate the Panel for incorporating
14 due process beginning with the scoping workshop.
15 Although it will add a great deal of time and work,
16 every opportunity must be given to allow the public to
17 become more familiar with the project, the scientific
18 principles involved, and to evaluate for themselves the
19 level of confidence and the degree of safety that will
20 accrue.

21 Education of the public will be a major
22 challenge. A relatively small proportion of the
23 Canadian population has sufficient background knowledge
24 in the relevant sciences to make even rudimentary
25 judgments on the processes and scientific principles



1 associated with nuclear waste disposal.

2 A substantial educational effort will be
3 needed to translate scientific complexities using
4 terminology that can be understood by the majority of
5 the population, because only with this information can
6 the public make a personal evaluation of the safety of
7 the proposed concepts.

8 The issues to be considered. Isolation of
9 nuclear fuel waste in a suitable geological medium is
10 probably the most suitable storage and disposal option.
11 However, working with natural materials always leads to
12 certain degrees of uncertainty, and a step by step
13 process is needed in projects of this nature.

14 It should be emphasized that engineers and
15 scientists have devised rational methods for dealing
16 with these uncertainties in what you might call a design
17 as you build process. This is an iterative process that
18 allows for knowledge gained during investigation, design
19 and construction operations to be used to improve the
20 project design. In this manner a high quality facility
21 can be achieved.

22 Engineering design process incorporates
23 investigation, analysis, design construction and post
24 construction monitoring. This process incorporates as
25 many iterations as required to produce post construction



1 modifications where monitoring and analysis indicates
2 there is a necessity. This engineering method has
3 withstood the test of time and has been used for many
4 difficult projects, including many that have advanced
5 the threshold of technical knowledge.

6 There is a very important role for the
7 engineer in this project and any project of this nature.
8 A development of the nuclear fuel waste management and
9 disposal concept is engineering as defined in the Acts
10 governing the practice of professional engineering in
11 Canada.

12 Successful project delivery will depend on an
13 engineering team consisting of professional engineers,
14 scientists, technologists, technicians and trade people.

15 It is important that the work be undertaken
16 under the jurisdiction of professional engineers since,
17 of all of the team members, it is only the professional
18 engineer who is required to subscribe to a code of
19 ethics which requires him or her to owe a duty to the
20 public, to the state, to maintain its integrity and to
21 maintain its laws. In a project of this magnitude, and
22 with the degrees of uncertainty and the lack of
23 understanding of the public, it is particularly
24 important that the work be overseen by a registered
25 professional engineer who is prepared to take



1 professional responsibility for the work and discharge
2 his or her ethical responsibility.

3 A time honoured system for the delivery of
4 engineering projects has assisted engineers in their
5 duty to protect the public. The system has three
6 components. The engineering seal, a review board and
7 public inquiry.

8 The engineer's seal is applied by the
9 professional engineer taking overall responsibility for
10 the work. The review board process consisting of
11 specialist engineers and scientists is assembled to
12 provide a detailed technical review. If the public
13 expresses further concern, the public hearing is
14 convened to explore and rule on the points of
15 contention. The Panel is strongly recommended and
16 encouraged to follow this process.

17 There is a strong need to ensure independence
18 in a project of this nature. There is a cynical
19 attitude on much of the public towards major
20 institutions and it will be difficult to assure the
21 public that an unbiased, independent evaluation is
22 taking place.

23 It is recommended that careful consideration
24 be given to the structure of the organization
25 responsible for producing the storage concept. Above



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1 all there has to be a freedom to act, independent of
2 external pressures, and a review Panel free to undertake
3 technical and socio-economic evaluations in an unbiased
4 and an unfettered manner.

5 Great care is needed to demonstrate this at
6 an early stage if the review process is to have
7 credibility. The process must be completely transparent
8 with all documents provided. Independence of action and
9 a transparent process such that anybody can see into it
10 are essential in maintaining credibility with a
11 questioning public.

12 To briefly summarize, a geological isolation
13 is currently the recommended option for nuclear fuel
14 waste storage and disposal, but it is important that the
15 uncertainties in dealing with the geological media are
16 explained to the public.

17 Only a small fraction of the public in Canada
18 has the academic background and knowledge to
19 independently evaluate the waste management concepts and
20 an education and interpretative program must be provided
21 to communicate the complex technical concepts to the
22 general public.

23 The traditional engineering design process
24 consisting of investigation, analysis, design,
25 construction, monitoring and post construction



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1 modifications must be explained to the public.

2 Development of nuclear fuel waste management
3 concepts constitute professional engineering and must be
4 delivered by an engineering team.

5 Professional engineers are the only members
6 of the team subjected to scrutiny for professional
7 registration, and the engineers are the only ones
8 required to uphold a Code of Ethics.

9 The traditional delivery system for
10 engineering design is applicable for this project.

11 It is recommended that all documentation
12 should be issued under the seal of a professional
13 engineer who will take responsibility for the work and
14 who will discharge his or her ethical responsibilities
15 to the public.

16 Subsequent scrutiny by a review board and
17 public scrutiny through an assessment Panel are the
18 other components of the traditional engineering process.

19 Finally, independence of action and a
20 transparent process are required to foster and maintain
21 credibility for the final storage concept in the eyes of
22 the public.

23 Thank you very much, Mr. Chairman.

24 THE CHAIRMAN: Thank you, Dr. Cook.

25 Questions from members of the Panel? Points



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1 of clarification which you would like? Dr. LaPierre?

2 DR. LAPIERRE: I have two questions. The
3 first one relates to a post construction monitoring. I
4 wonder if you have any indication of the amount of time
5 that this post construction monitoring should take
6 place?

7 DR. COOK: Post construction monitoring
8 depends on the nature of the project which you are
9 undertaking, and it may be carried out for years and
10 years and it may be carried on forever as is necessary.
11 This is something which is assessed as time goes on and
12 based on the assessment you continue as necessary.

13 To give you an example, an earth filled dam
14 may be shifting with time and you would want to monitor
15 the shifting of that dam continuously and take any
16 corrective action as is necessary when you discover the
17 need for it.

18 DR. LAPIERRE: The other question I have is,
19 you indicated that an education interpretive program
20 must be provided to communicate the complex technical
21 concept to the general public. Do you have any idea who
22 should do that?

23 DR. COOK: That is a difficult question to
24 answer and it is one that the engineering profession has
25 been groping with for a great deal of time.



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1 It is a talented person, a skilled person,
2 that we're looking for in this case, and wherever you
3 can find such a person you make the best use of the
4 available resources.

5 The initial reaction that I would have, for
6 example, is the program on television, The Nature of
7 Things, where you found one person who was able to
8 explain things well and he uses the right terminology
9 and that's the sort of person you have to use. Not all
10 engineers are going to be very good at explaining
11 things, and the engineer is not necessarily the person,
12 nor in some cases the scientist is not necessarily the
13 person. You should develop a core of people who have
14 the ability to reach as teachers, and a core of people
15 who can understand the scientific and engineering
16 principles that are necessary to be described.

17 DR. LAPIERRE: Thank you.

18 THE CHAIRMAN: Dr. Wilson.

19 DR. WILSON: I have two.

20 You mentioned the Code of Ethics. It is
21 interesting, as we've gone across the country there are
22 some who say the ethical thing to do with this nuclear
23 waste is to bury it so that future generations won't
24 have to think about it, and there are others who say if
25 you do that then you rob future generations of their



1 ethical responsibility and their humanness. Where would
2 you come down on that one?

3 DR. COOK: The problem that I see personally
4 in this is that we have a responsibility today to
5 provide the energy and to provide a safe storage for the
6 fuel, and we have no option really when there is the
7 fuel there that we have to somehow or other provide that
8 storage.

9 As to whether it's going to have long-term
10 effects, we would work very hard to try to minimize
11 those long-term effects.

12 Now future generations are also going to be
13 faced with the same sort of problems, where we've always
14 had problems in terms of looking after the current
15 problems that we have and the inherited problems that
16 have been developed in the past. Society has undertaken
17 this traditionally and I think society would continue to
18 undertake it.

19 DR. WILSON: So you're at both ends.

20 The other thing you mention here is it's
21 important that the uncertainties in dealing with the
22 geological media are explained to the public. I agree
23 but once they're explained that may not make them
24 acceptable to the public.

25 DR. COOK: That is true.



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1 DR. WILSON: So again I guess it is the same
2 question that Dr. LaPierre asked because we're charged
3 not only with the safety of this but the acceptability.
4 Would the engineers have some contributions in that
5 area?

6 DR. COOK: I think they would. If you were
7 working with rock formations as the proposal here is
8 envisaged to be, you were working with something which
9 in the case of the Precambrian Shield, something that
10 has been there for hundreds of millions of years, in
11 fact billions of years. It's been there for a long
12 time. It would seem to be as safe as the old expression
13 the Bank of England. On the other hand, the same
14 formation is part of a relatively thin crust on the
15 earth's surface, and that relatively thin crust,
16 therefore, is subject to faults, to cracking, and so on.

17 Now, in dealing with this sort of thing there
18 are ways of working with it, and to give a personal
19 example, I had the opportunity 36 years ago to see the
20 Comano (phonetic) power project on the west coast of
21 B.C. The Comano power project is the power plant that
22 was built inside a mountain to provide the electricity
23 to Kitimat. I don't know whether any of you have seen
24 that or not. But this was a situation where they were
25 working in a rock structure and where they took a great



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1 deal of time to figure out what the problems were going
2 to be there, inside a mountain literally. There is no
3 structure in the power plant. It's just a hole inside
4 the mountain. They were able to solve the problems
5 there and they are able to correct the problems as they
6 go along.

7 My feeling is that the Canadian engineering
8 expertise and knowledge of rock mechanics and the
9 experience we've gained makes us probably one of the
10 better countries in the world in terms of being able to
11 tackle a project like this.

12 THE CHAIRMAN: Mr. Van Vliet.

13 MR. VAN VLIET: Dr. Cook, you identified that
14 a method for dealing with the uncertainties of such a
15 project are described as a design as you build process,
16 as you identified on page 3. How do you reconcile a
17 design as you build process with an evaluation of a
18 concept such as we are considering here without being
19 site specific?

20 DR. COOK: It's a question of whether you
21 know all the answers. Whether you start into something
22 or whether you don't know all the answers, and in many
23 situations we haven't known all the answers when we've
24 started into the overall project, but recognizing that
25 we don't know all the answers we carry on from there and



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1 discover the answers as we go, and this is what requires
2 design as you build.

3 One of the classic examples in Canadian
4 history is building the railroads across the country.
5 Laying down railway track seems like a very obvious
6 proposition and yet Sanford Flemming in New Brunswick
7 was developing most of the theories of soil mechanics as
8 he went along. As he came to something new, like a new
9 type of gravel, sand, whatever he came up with, he then
10 had to figure out what the answers were, how am I going
11 to continue on in this project, and that project,
12 perhaps more than any other in Canadian history, was a
13 real design as you build project. It is possible and it
14 achieves the results.

15 MR. VAN VLIET: Is it still possible then to
16 evaluate the concept without being site specific?

17 DR. COOK: I believe it is, yes. You deal
18 with the overall concept and with the possibilities that
19 you anticipate, and at the same time allow yourself
20 escape routes as you go along. What am I going to do
21 if.

22 One of the best industries in Canada in that
23 respect, from my point of view, is the nuclear industry.
24 I've had brief experience with the nuclear industry and
25 I was quite impressed by the amount of effort that the



1 nuclear industry puts into questioning themselves and
2 saying what if. I was part of Hazards Analysis, for
3 example, for the Whiteshell reactor and we were asking
4 ourselves what if all the time, and the safety record of
5 the nuclear industry has been quite phenomenal.
6 Probably the best safety record that there is of any
7 industry in Canada, if not the best.

8 MR. VAN VLIET: I have another question.

9 THE CHAIRMAN: Yes, indeed.

10 MR. VAN VLIET: You're also indicating on
11 page 4 that it must be shown that the design
12 organization is given the freedom to act independent of
13 external pressure. In your opinion is that possible
14 within the structure of one corporation, be it an
15 independent corporation or a crown corporation?

16 DR. COOK: I think it is possible and I think
17 it's absolutely essential. If there are political
18 pressures to make certain decisions, or industrial
19 pressures to make certain decisions we have a very
20 serious problem on our hands, and this problem has been
21 something which has come up on a number of occasions in
22 recent years, and the expression is blowing the whistle,
23 where engineers in fact in cases have had to say the
24 decisions being made in my company are not in the best
25 interests of the public and I have to go public on that



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1 thing.

2 I would very much hope that we can build an
3 organization which could carry out a project like this
4 without a need for any of the engineers in the process
5 to have to blow a whistle.

6 MR. VAN VLIET: Do you see a potential
7 conflict of interest between the producer of the waste
8 and a corporation or an entity that -- or if the same
9 corporation had to look after the disposal of the waste?

10 DR. COOK: There could be, yes, but on the
11 other hand there could be a structuring of authorities
12 to get around that, and knowing that the problem exists
13 you would have to arrange that this is built into the
14 overall organization and the lines of authority and
15 responsibility.

16 MR. VAN VLIET: Thank you.

17 THE CHAIRMAN: Dr. LaPierre.

18 DR. LAPIERRE: Dr. Cook, a question
19 regarding your design as you go concept which I think
20 might be quite acceptable to engineers, but how do you
21 reconcile this concept with a public that wants a
22 guaranteed degree of certainty before a project goes
23 ahead when they perceive a danger with the project
24 itself?

25 DR. COOK: I think there have been many



1 projects in the past which have been challenges part way
2 through, and the idea when you run into a problem that
3 you can't solve and there is no way of solving it that's
4 the time to call it quits on that particular project.

5 Now it could be site specific. You may
6 start into an operation and find out that as you get in
7 underground fault structure such as you can't proceed
8 any further there. It doesn't necessarily mean that you
9 can't start into another structure elsewhere.

10 DR. LAPIERRE: But my question relates more
11 to the public. How is the public going to perceive such
12 a project because they require -- they're asking for an
13 absolute certainty before they accept such a project
14 because they perceive that the waste itself is dangerous
15 and because we all agree that it has to be dealt within
16 some special conditions. But how do you address that
17 factor in the general population?

18 DR. COOK: On a personal note, nothing is
19 ever certain except death and taxes. But from the point
20 of view of the public, in a situation like this I think
21 the public has to have some faith in the people that are
22 undertaking this project, but at the same time to have
23 that faith they have to have people that they know are
24 responsible, who are willing to take a responsible
25 position and this is part of the education process. To



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1 show that there are people who are taking responsibility
2 for this project and are going to ensure that it is safe
3 to the public and make the correct decisions at any
4 point where they find that they're running into
5 difficulties.

6 THE CHAIRMAN: Mr. Van Vliet.

7 MR. VAN VLIET: Following along the lines of
8 Dr. LaPierre's questions, you indicate that an education
9 and interpretive program must be provided to communicate
10 the complex technical concept to the general public.
11 That's a formidable task.

12 DR. COOK: I agree entirely.

13 MR. VAN VLIET: Who do you see as responsible
14 for that?

15 DR. COOK: It could be anybody. I remember
16 one public hearing in Saskatchewan for the Coronat
17 (phonetic) where the presentation made on behalf of the
18 power corporation was written twice. The first time it
19 was written it was realized that the public wouldn't
20 understand it and so the entire presentation was
21 rewritten. It was rewritten in terms of not using words
22 like boiler because the people don't necessarily
23 understand what a boiler is unless you explain ahead of
24 time. I think that's part of the process.

25 THE CHAIRMAN: Dr. Wilson..



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1 DR. WILSON: I would like to ask, do you see
2 this in any way as more than a technical problem to
3 explain to the public? Are we more into technical stuff
4 here and if so what are we into?

5 DR. COOK: Yes, I do. As I mentioned just a
6 little while ago, part of the education process goes
7 beyond technical in the sense that we have to provide a
8 demonstration or proof or an assurance of the faith in
9 the people that are actually working on the project, and
10 there are other factors that will come up.

11 The public is largely concerned about the
12 technical side because they don't understand the
13 technical side, but that's certainly not the only part
14 of the problem.

15 THE CHAIRMAN: Any further questions? If not
16 thank you very much indeed, Dr. Cook for coming and
17 speaking on behalf of the Association today.

18 DR. COOK: Thank you.

19 ---Dr. Cook withdraws

20 THE CHAIRMAN: The next participant I have on
21 my list is Ms. Tannis Goldenstein. Please go ahead.

22 PRESENTATION BY MS. GOLDENSTEIN:

23 Good evening Chairman and Panel members. My
24 name is Tannis Goldenstein and although I didn't receive
25 any information with regards to this evening's meeting,



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1 I am very concerned that Canada will become a
2 radioactive garbage dump for other countries.

3 For 13 years Atomic Energy of Canada Ltd. has
4 made statements in every publication and to all news
5 media that deep geological disposal vaults of high-level
6 radioactive waste is safe.

7 In 1976 Robert Hart, vice-president of
8 Whiteshell Nuclear Research Establishment stated that
9 disposal of radioactive waste should be a simple matter.
10 We'll just bury the radioactive waste underground in an
11 area of one square mile.

12 I feel radioactive waste should be kept where
13 it is produced and that Canada should not become a
14 garbage dump for the world. There are 27 countries
15 producing radioactive waste in nuclear power plants.
16 These radioactive wastes should not be transported on
17 waterways and highways.

18 THE CHAIRMAN: Yes, any questions to put
19 there?

20 I was going to ask, you, I think, said that
21 the radioactive waste ought to be retained where it is
22 produced. Is that the gist what of you --

23 MS. GOLDENSTEIN: Yes.

24 THE CHAIRMAN: I see. Well some, of course,
25 is produced in Canada, as you know, at nuclear stations



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1 in parts of Canada. Is your thought that it should be
2 retained close to those stations then, or that it should
3 go somewhere else for later disposal? I wonder if you
4 have any thoughts on that?

5 MS. GOLDENSTEIN: I feel that more research
6 is needed. I haven't researched myself in regards to
7 the nuclear waste issue, but research is definitely --
8 it's always needed and whichever is more suitable. I'm
9 not certain whether it should be closer to where nuclear
10 waste is produced or just one major area. But it should
11 be retained in Canada.

12 THE CHAIRMAN: Dr. LaPierre.

13 DR. LAPIERRE: Well, that essentially was my
14 question. So you have asked it.

15 THE CHAIRMAN: Sorry I cut out, member.

16 Dr. Wilson.

17 DR. WILSON: I would like to ask -- I mean
18 it's quite clear from your documentation that you don't
19 want to bury other countries' radioactive waste in
20 Canada. Why not?

21 MS. GOLDENSTEIN: I feel that Canada should
22 deal with its own radioactive waste and other countries
23 should deal with their own. I don't want to see Canada
24 becoming the world's garbage dump. That we take all --
25 everybody's garbage. I don't think -- I don't like the



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1 picture of Canada becoming a garbage dump of the world,
2 of us receiving all of the world's garbage. Canada will
3 just eventually, after many, many centuries and years,
4 just fill up, just as the vaults or as the plants are
5 filled, they're going to have the build a new one and
6 keep building right across -- right in Canada. Like
7 it'll just take over the province probably or the
8 provinces.

9 THE CHAIRMAN: Dr. Reese.

10 DR. REESE: You know, you were concerned
11 about Canada becoming the dumping ground for other
12 countries. I would just like to follow that a little
13 bit further.

14 Would you be willing in one province to
15 accept the garbage of another province or one part of
16 the province to accept the garbage of another part of
17 the province? Do you follow me?

18 MS. GOLDENSTEIN: Yes.

19 DR. REESE: I can understand your
20 nationalism, that you only want Canadian garbage in
21 Canada.

22 I guess the next question though is, is this
23 by province, by county, by city, by block?

24 MS. GOLDENSTEIN: By country.

25 DR. REESE: Thank you.



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1 THE CHAIRMAN: Any other questions?

2 Thank you. Thanks very much. It was good of
3 you to come out.

4 ---Ms. Goldenstein withdraws

5 THE CHAIRMAN: The next person I have on my
6 list is Ms. Maisie Shiell speaking on behalf Grandma's
7 Environmental Fund.

8 Ms. Shiell, please.

9 PRESENTATION BY MS. SHIELL:

10 Good evening. I have addressed what I would
11 like to see in the EIS for the concept of the high-level
12 waste burial in Canada.

13 The burial of high-level radioactive waste
14 500 or 1,000 metres below the ground in a granitic
15 pluton in Precambrian Shield in Ontario is an extremely
16 risky concept.

17 EPA, the U.S. Environmental Protection Agency
18 is quoted as having said in 1978 - now certainly this is
19 12 years ago - "Unlike ordinary engineering problems,
20 there is no experience with long-term, sealed
21 underground storage of such materials, and thus no
22 foundation of empirical knowledge upon which to build."
23 This is what makes it so different than the other
-24 engineering examples we've been hearing about.

25 The highly toxic long-lived radionuclide,



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1 Plutonium-239, which has a half life of 24,000 years is
2 what makes the concept of burying this high-level waste
3 so dangerous and so risky for future generations.

4 As I see the problem in Canada, it can and
5 indeed it should be, divided into two problems.
6 Firstly, Canada has already allowed 13 or 14,000 tons of
7 this potentially dangerous waste, if it is ever allowed
8 to escape, to build up prior to having the technology to
9 deal with it in the long run. At present this is being
10 safely stored on a temporary basis in swimming pools or
11 in shielded containers. Since no way exists of
12 disposing of it, our first problem must be how to deal
13 with what we have already got.

14 Our second problem concerns whether or not we
15 should be continuing to produce more, and I realize that
16 you have said that this is not the concern this evening,
17 but we have to divide these two problems is what I'm
18 telling you.

19 I would like to see these two separate
20 problems discussed in the EIS from both a practical and
21 a philosophical point of view. I would also like to
22 suggest that the EIS be written in language that a
23 layperson can understand. It is very important that
24 ordinary people are able to understand what is being
25 said. The use of scientific terms that are not



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1 understood by the general public not only makes the EIS
2 very difficult to read, but also are suspect often as
3 being used in order to try to fool us. If it is not
4 possible to avoid such terms, perhaps they could be
5 explained in the following sentence or paragraph. If
6 this is not possible, a glossary should be provided. I
7 consider it is absolutely essential that the author of
8 the EIS, AECL, must, so to say, bend over backwards to
9 be extremely honest and balanced in the information it
10 gives in that EIS.

11 The nuclear industry has been guilty of
12 telling a one sided story, hoping in this way to fool
13 the people into accepting uranium mines, reactors and
14 disposal sites. One of the results of this strategy of
15 the nuclear industry has been a loss of confidence by
16 many of us. So I'm suggesting that AECL should take off
17 its rose coloured glasses and honestly tell the bad side
18 as well as the good. The EIS should honestly deal with
19 risks and with the possible long-term consequences.

20 I believe the EIS should include a discussion
21 of radiation. The different types of radiation, the
22 different half lives, and the products of radioactive
23 disintegration, which may be radioactive or stable. The
24 implications of gamma and alpha radiation and the long
25 and short half lives, et cetera, should also be



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1 discussed.

2 The EIS should list the actual radionuclides
3 that will be stored in the proposed vault indicating
4 their types of radiation emitted, their half life and
5 the product resulting and whether it be radioactive or
6 stable. Also the quantities of each at a certain date
7 be given in bequerels per gram in each bundle, because
8 of course, these quantities are changing as they
9 disintegrate. Plutonium-239 should be dealt with on its
10 own also.

11 The EIS must describe the actual containment
12 and must explain the rationale for choosing the
13 particular material such as titanium or copper or glass
14 beds or lead. The same with the clay material that AECL
15 intends to surround the containers with. References
16 that have led to these choices should be given and
17 should be publicly available.

18 Since it is vital that the highly toxic
19 radioactive spent fuel be securely contained for at
20 least a hundred thousand years, that is until the
21 Plutonium-239 has disintegrated to 1/16 of its original
22 amount, the methods and material being used in the
23 containment must be able to be scrutinized by the
24 public. The containment is the key. The public, who
25 must take the ultimate responsibility, must be able to



1 understand if they are going to adequately scrutinize
2 these conceptual plans.

3 In 1986 in Winnipeg, at a conference
4 organized by the Concerned Citizens of Manitoba, many of
5 use were able to learn a little about some of the real
6 difficulties involved in attempting to secure these
7 high-level radionuclides in granite rock.

8 Marvin Resnikoff explained some of the
9 difficulties which involve the tiny 1/1000 of an inch
10 hairline fractures in the granite rock. How the
11 difference in the pressure - wait a minute, I think I've
12 gone off a line - how drilling in fact may create or
13 enlarge these fractures. How the difference in pressure
14 between the rock and the mine would press ground water
15 from the rock into the mine. How heat from the waste
16 fuel would gradually travel to the rock thus enlarging
17 the fractures.

18 In fact giving this -- Mr. Resnikoff --
19 giving the U.S. Department of Energy figures, his
20 presentation gave the possible lengths of time that it
21 might take for the contaminated water to reach the
22 surface.

23 He quoted the U.S. Geological Service as
24 saying, in 1978 again, "Given the current state of our
25 knowledge, the uncertainties associated with hot wastes



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1 that interact chemically and mechanically with the rock
2 and fluid system appear high."

3 I have included an appendix with this brief
4 which is this presentation, a copy of the presentation
5 by Resnikoff have because maybe I haven't, you know,
6 interpreted it correctly, but to me it seems -- it is up
7 to AECL in the EIS to tell us how such uncertainties are
8 going to be overcome. And here I say that I have
9 attended the...

10 In a section called "Learning From Nature" in
11 a AECL brochure, we are told that studies of uranium
12 mines in Northern Saskatchewan and Gabon in Africa, have
13 given that corporation confidence that their plan will
14 be safe and secure. Their arguments are based on the
15 fact that mother nature has kept huge ore bodies safe
16 and secure from the environment for two billion years.
17 I personally find this extremely impressive, but I have
18 yet to be convinced that AECL can so easily duplicate
19 what nature has achieved, and this in actual fact from
20 reading the paper I still -- I most certainly wasn't
21 convinced by it. I personally find this extremely --
22 oh, I've done that.

23 I have also read a paper on this subject by
24 Jan J. Cramer. Now, I brought a copy with me. I
25 haven't given you this, but in this paper Cramer



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1 explains how, by a number of studies on different mines
2 in northern Saskatchewan, by various scientists, they
3 have been able to put together a hypothesis of how this
4 has been achieved by nature.

5 Reducing conditions in the water have led to
6 chemical reactions that in turn have led to a clay halo
7 around the ore bodies. Apparently this paper is
8 suggesting that we can copy the clay halo, but can we
9 copy the reducing conditions? I would need very
10 detailed explanations of method and material of how AECL
11 intends to achieve this before I can possibly feel any
12 confidence, and I have given the references there. I
13 think it's on the back of page 2.

14 THE CHAIRMAN: Yes. Thank you, Ms. Shiell.
15 I was going to ask you for the reference to Jan J.
16 Cramer but you have --

17 MS. SHIELL: I have given it. It's on the
18 back of page 2 you'll find it.

19 THE CHAIRMAN: I see that. Perhaps we can
20 just check with the Secretariat and see where that
21 appeared so that we will be able to pin it down quite
22 readily. It may have been in a scientific journal.

23 MS. SHIELL: I believe I picked it up at an
24 AECL information meeting. So I think it should be
25 readily available.



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THE CHAIRMAN: Good.

MS. SHIELL: Would you like me to send it around at least.

THE CHAIRMAN: Thank you. We will give that back to you.

MS. SHIELL: It's very badly marked up I'm afraid.

THE CHAIRMAN: It's your only copy but I'd just like to make sure that we have the correct reference for it. I will get the secretary to do that.

Now questions for Ms. Shiell, please, from any members of the Panel who would like to put them?

Mr. Van Vliet.

MR. VAN VLIET: Ms. Shiell, you indicate that you would like to see the Plutonium-239 kept until it has disintegrated to 1/16 of its original amount.

MS. SHIELL: I'm not hearing you very well. Would you mind speaking up?

MR. VAN VLIET: You indicate in your paper that the Plutonium-239 should be kept securely contained until the material has disintegrated to 1/16 of its original amount. Are you referring to a level of radiation and if so why did you chose 1/16?

MS. SHIELL: Okay. I'm referring to the amount of plutonium. The plutonium is -- the



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1 radioactivity is disintegrating and the atoms in the
2 pluton are disintegrating and therefore you lose that
3 atom. It goes into another material.

4 So it has a 24,000 year half life so in
5 24,000 years, half the atoms that you put down there
6 will be disintegrated. Okay, so you've got half left.
7 You've got half left, and half has already gone. Then
8 with another 24,000 years you get another quarter. So
9 it's half of what you've got, okay, and by a hundred
10 thousand years you'll still have 1/16 left and this is
11 very, very dangerous deadly stuff. Whether a hundred
12 thousand years is even enough, you know, but that, at
13 least, is what I'm saying.

14 MR. VAN VLIET: And 1/16, was that a
15 reference to the level of the background natural
16 radiation?

17 MS. SHIELL: Plutonium is not a natural
18 radionuclide.

19 MR. VAN VLIET: No, but the radiation that
20 comes from that remain --

21 MS. SHIELL: Well, yes, the radiation that
22 comes from that is -- the really dangerous part of it is
23 the alpha radiation in that, and if the water takes it
24 and it gets dissolved, then this alpha will get into the
25 food chain, et cetera, et cetera, et cetera.



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1 MR. VAN VLIET: Thank you very much.

2 MS. SHIELL: So talking of rems and things
3 doesn't -- but I did ask in my paper that at least it be
4 talked of in bequerels. How much plutonium in bequerels
5 are they going to put in there. One bequerel is one
6 disintegration per second so we know how much radiation
7 we've got there then.

8 MR. VAN VLIET: Thank you very much.

9 THE CHAIRMAN: Dr. Reese.

10 DR. REESE: Just for a little clarification.
11 The problem with saying 1/16, that is true you have four
12 half, fives.

13 MS. SHIELL: Yes.

14 DR. REESE: But the important thing is how
15 much do you start with, how much do you have. In other
16 words 1/16 of a large number is still a hell of a lot
17 more than the whole amount of a small number. So that
18 then itself doesn't mean anything.

19 MS. SHIELL: Well, we don't know how much we
20 start with so what else -- how else can we describe it?

21 DR. REESE: Well, these numbers are
22 available.

23 MS. SHIELL: Well, I have not received the
24 number. That's why I've asked in there that the EIS
25 state the number.



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1 DR. REESE: Fair enough.

2 THE CHAIRMAN: Stating absolute amounts that
3 they would predict would be necessary.

4 MS. SHIELL: I didn't hear.

5 THE CHAIRMAN: You've asked that the EIS
6 contain an indication of the expected original amounts
7 which be would placed in the disposal vault?

8 MS. SHIELL: If you have the original amount
9 you can work out because you know the disintegrations
10 how they're -- especially if you have that amount given
11 to you in bequerels.

12 THE CHAIRMAN: Dr. Wilson.

13 DR. WILSON: You've have mentioned in your
14 paper some of the areas that you think the public should
15 know, not the certainties, but the risks. You've
16 mentioned the actual container, the effective radiation,
17 the fractures in granite rock, the ground water, the
18 heat and some of those things.

19 Now we're charged with not only the safety of
20 the concept which you've mentioned quite a number of the
21 things, but also the acceptability. Do you have any
22 thoughts on what would make this concept of the disposal
23 site acceptable to a community? What would a community
24 need to know before it would be acceptable?

25 MS. SHIELL: Well, I think in my brief that's



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1 what I say. To me, you know, I'm the public, I suppose
2 too, and I have done quite a lot of reading and studying
3 about this subject, but I certainly have still to be
4 convinced. I'm fairly convinced by Mr. Resnikoff, you
5 know, and by EPA and by, you know, but we are saying the
6 tone of what AECL's brochure, that's all I've seen, the
7 brochure from AECL, is saying oh, it's quite safe, you
8 know. I suppose it does sort of put some risks, but it
9 doesn't -- it really leads one to believe that if we
10 follow things like this and we copy nature we can do it,
11 you know, and they haven't convinced me because -- I
12 mean here I'm going to do some more reading about this
13 now, but just the little bit I've done, I went to this
14 conference and I heard -- there's a number of other
15 articles in here as well, and I tried to read them up
16 before I made this presentation.

17 So I think we've dealt -- it is and
18 unfortunately we've got -- I work mostly with the
19 uranium industry and we get a lot of really foolish
20 stories told to us.

21 On a TV show I've got a video of, I had to go
22 on a debate with the Cameco company and it was the
23 communications officer, but she said that -- she said
24 for centuries this mine, the mine is right on the edge
25 of Wallaston Lake, for centuries this mine has been



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1 leaching into Wallaston Lake.

2 The study I've just sent around there, it
3 does explain and I've known for a number of years how in
4 fact the uranium is not leaching. It's because nature
5 has found this way of safeguarding it, okay, but here,
6 you know, she's going to tell the public that and in
7 fact she has the gall to say and we are doing much
8 better.

9 I think she does another thing with these
10 radionuclides too, and it really sounds quite logical to
11 the public. I'm not sure if I can -- I think I'll skip
12 that one. I can't really remember it at the moment. My
13 mind isn't right there.

14 THE CHAIRMAN: Dr. LaPierre.

15 DR. LAPIERRE: Thanks a lot, Mrs. Shiell for
16 your presentation.

17 I have one question regarding a comment that
18 you made in your --

19 MS. SHIELL: Would you mind speaking into
20 your mike?

21 DR. LAPIERRE: I have one comment regarding
22 a -- one question regarding a comment you made regarding
23 the risk for future generations. Present generation is
24 using the electricity and producing the waste. I wonder
25 if you have any comments or further expansion on that,



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1 your responsibilities to future generations with the
2 present day waste?

3 MS. SHIELL: Well, I'm putting a
4 tremendously -- I really spend my entire life worrying
5 about the high grade uranium mining in Northern
6 Saskatchewan. Not because of this generation but
7 because of the next generations. Here the radium is --
8 and the thorium are just as long lived as the plutonium
9 or longer lived the thorium is 80,000 years and so I
10 just think it's totally unacceptable that we put the
11 cost onto our children in the future. That's why I am
12 doing what I am doing.

13 THE CHAIRMAN: Any further questions from
14 Panel members?

15 Thank you, Ms. Shiell, and thank you for
16 being quite explicit in the things which you think
17 should be -- the questions which you think should be put
18 to AECL in its environmental impact statement.

19 Thank you very much.

20 ---Ms. Shiell withdraws

21 THE CHAIRMAN: I have next on my list for
22 this evening, Mr. Al Taylor. He is here? Good.

23 PRESENTATION BY MR. TAYLOR:

24 You know now, Mr. Chairman, why I'm a happy
25 financial contributor to Granny's Environmental Fund,



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1 and I wish my brief was as well prepared as hers.

2 Thank you very much. Good evening, Mr.
3 Chairman and Panel members. Thank you very much for
4 giving me this opportunity to -- I'll present a very
5 short brief. I'm afraid its ill prepared and short
6 mostly because the environmental movement is being
7 consulted to death this summer in Saskatchewan and you
8 happen to be the last folks on the list this month and
9 we've just spent a great number of days preparing for
10 other things.

11 Anyway, my name is Al Taylor as you obviously
12 know. I guess I've been involved in the environmental
13 movement, an activist, since about 1968, and I've been
14 opposed to uranium mining and the production of
15 electricity with nuclear power ever since I can sort of
16 remember, but certainly since we started mining this
17 stuff in Saskatchewan.

18 I guess a bit more brief history. I've
19 worked in the -- I've been in the public health field
20 for about 25 years and in the social service field for
21 another 10 years and I'm now a retired federal civil
22 servant.

23 I'm just going to actually make a few
24 comments saying amen to nearly everything Maisie said
25 and she certainly does much more research on it than I



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1 do.

2 I guess I think wastes are inherently
3 dangerous. I'm not so sure you're asking the right
4 question. Maybe it should be what if the process is
5 inherently unsafe what are we going to do? Should we
6 continue with the way we are? I would argue that if
7 wastes are inherently dangerous it's the height of
8 arrogance to produce a high-level waste when we still
9 don't have scientific agreement that there is safe
10 disposal, and we can bring in the arguments about future
11 generations, which is a very important one having
12 children and grandchildren and hopefully being around
13 for great grandchildren. I think it's an important
14 question and it has to be asked.

15 My position is that we should have no new
16 nuclear power plants and quit decommissioning of the
17 present plants. I realize that there are present wastes
18 that have to be stored, but I would argue that they
19 should be stored at the nuclear power plants in Ontario
20 and Quebec and New Brunswick and kept in their present
21 swimming pools.

22 Simple justice dictates that those who have
23 had the benefits can now have the environmental social
24 health and economic costs in investing in a technology
25 that again I would argue is inherently unsafe and can



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1 never be sustainable. Never. The NIMBY Syndrome is
2 quite legitimate where nuclear wastes are concerned.

3 Your mandate is to critically review and
4 comment on the acceptability and applicability of AECL's
5 high-level fuel waste disposal concept from a scientific
6 and engineering point of view.

7 I ask that when you critically review and
8 comment that you use the principles of sustainability
9 and I've got a copy here and I'll leave it with you that
10 came from -- pardon me, Principles of Sustainability as
11 outlined in Alternatives Volume 17 No. 2, 1990.

12 I believe that by using these principles, you
13 will find that nuclear power and all the wastes that are
14 produced cannot meet standards of sustainability. If
15 the technology cannot meet sustainable criteria then it
16 should not be allowed to continue producing.

17 I do not want to read all of the recent
18 article that appeared in the Harrowsmith written by F.P.
19 Hughes, but I will leave a copy for the records.
20 However, I do wish to read just some quotes that tend to
21 put energy from nuclear power into perspective, and
22 again leads me back to the question, if it is -- well
23 two questions. What are the alternatives to nuclear
24 energy and are they much, much more -- are they
25 inherently safer than nuclear energy and can we get our



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1 energy from them and if the process is inherently unsafe
2 why are we dealing with it other than to contain it and
3 not let it grow anymore.

4 Just a few of the quotes, "Many people are
5 startled to learned that wood provides Canadians with
6 more energy than nuclear reactors do," and we've known
7 that for quite a few years. "Despite the billions of
8 dollars that have been squandered, the lives put at
9 hazard and the public relations whoppers told, nuclear
10 power has not yet caught up with firewood as a source of
11 energy in Canada."

12 It is perfectly possible to generate
13 electricity from wood on a large scale without
14 pollution, without adding to global warming or the
15 greenhouse effect and without waste and without having
16 to try and bury hot level waste for one hundred thousand
17 years which, I would argue, ladies and gentlemen, are
18 theological time scales, certainly not engineering time
19 scales, and certainly not in the time scale of the human
20 beings in this building here.

21 I'll leave it with you. I've got quite a few
22 of them underlined in yellow, they're lovely quotes, it
23 seems to me, to make for doing something with wood and
24 we can certainly do it.

25 I guess that's the end of my presentation. I



1 will leave you -- I believe the Principles of
2 Sustainability are something more than worthwhile
3 looking at and reading, and as I say it seems to me you
4 have to have some basis on which to start making
5 decisions and if we use sustainability as an overriding
6 principle, I guess I feel that nuclear power is on its
7 way out.

8 Thank you very much.

9 THE CHAIRMAN: Perhaps you would be kind
10 enough to lend both of those articles to the Secretariat
11 then they can make sure they have the proper notation
12 and return them to you, of course, before you leave this
13 evening.

14 MR. TAYLOR: You can even have them.

15 THE CHAIRMAN: A contribution. Thank you
16 very much indeed. That's great.

17 Are there questions which members of the
18 Panel would like to put to Mr. Taylor?

19 THE CHAIRMAN: Mr. Van Vliet.

20 MR. VAN VLIET: Mr. Taylor, you indicate that
21 you would like to keep the waste where it is in these
22 water filled bays at the nuclear power plants. Do you
23 consider those locations and those methods of storage
24 safe for the long-term?

25 MR. TAYLOR: Well, I'm not a scientist. I



1 don't know. It seems to me we've accepted -- the
2 scientific community as accepted them up till now as
3 being a safe way of disposing of waste in a short term.
4 They probably being -- I suppose there's the whole
5 business of getting into the plutonium fuel cycle, which
6 I would argue is even more dangerous than what we are
7 trying to do now.

8 But I see it as at least staying in the
9 swimming pools, the folks that tell us if we're to
10 believe them and there's a fair amount of distrust of
11 the nuclear community, that they're telling us that they
12 are safe now. I would argue that they should be able to
13 maintain their safety for the lifetime of the products
14 that are in there.

15 MR. VAN VLIET: So essentially you are
16 saying that current technology is safer than future
17 technology?

18 MR. TAYLOR: I don't know. Do you know what
19 future technology is going to be? I don't. It may be.

20 MR. VAN VLIET: You're make a value judgment
21 in saying keep it where it is.

22 MR. TAYLOR: Until there's a safe method.
23 Until there's a safe method discovered that the
24 scientific community agrees to stop producing it. It's
25 unfair. It's just -- not only unfair, it seems to me



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1 it's immoral to produce a product right now that we
2 don't know that we can put away safely and yet we
3 continue to produce it and you folks are trying to run
4 around the country now trying to get a feeling from
5 people of whether or not they want to accept that kind
6 of disposal, and I would argue before you're finished
7 that the scientific community is going to say it's not
8 safe.

9 Maybe that's a bad prediction on my part, but
10 it just seems to me that technology is not developed to
11 the point where it's going to be -- where the high-level
12 wastes are going to be able to be contained safely and
13 so while we continue to produce it, my position is you
14 guys that are producing it you keep it underneath your
15 basements. When you decide to stop producing it then
16 I'm willing to look at some sort of disposal because
17 it's there. I agree we have to do something with it.
18 It's absolutely preposterous that we have those
19 high-level wastes. Its preposterous that we have them.
20 It's immoral that we continue producing them until we
21 can put them away safely. I don't think you're going to
22 find that method. That's a value judgment to the
23 future, you're right.

24 MR. VAN VLIET: Thank you.

25 THE CHAIRMAN: One question if I may and it's



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1 a rather broad one, but you mentioned that you've been
2 active in a broad range of environmental activity, not
3 just exclusively this area of course.

4 The concepts of safety and risk are very,
5 very difficult ones to come to grips with I would
6 suggest, especially as there's some tendency to hope
7 that they might be absolute terms. I guess I feel that
8 they're is nothing in this world which is absolutely
9 risk free nor absolutely safe. Yet questions along the
10 lines of degree of safety, degree of risk have to be put
11 and have to be answered somehow.

12 Within your experience, dealing with -- you
13 know, looking at the dangers of this or other products,
14 have you come to any helpful thoughts as to how one
15 addresses those questions? How one gets the public and
16 all of us as members of the public to come to grips with
17 those difficult concepts?

18 MR. TAYLOR: I'm not quite sure I understood
19 the question other than that I don't know. I guess if I
20 had the answers I'd probably be rich.

21 I guess I think the things that are of most
22 concern to me when you talk about -- well, I guess just
23 talking about this. Like understanding the nuclear fuel
24 cycle is a bit difficult to start with and when you
25 start talking make Maisie about Plutonium-129 or 93 or



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1 whatever it is, like you're just way over my head.

2 It seems to me that some of the things,
3 though, when you get to talking about risks, if I have
4 some control over it I'm willing to eye it. But if I
5 don't have any control over it then it seems to me that
6 I want to have somebody -- either I want a very
7 trustworthy person or trustworthy group of people eyeing
8 it very carefully and saying that the risk is not --
9 well, that there's a certain degree of risk, but we
10 think it's manageable.

11 The problem with that, it seems to me, and
12 particularly when we talk about this, you enter into a
13 field where there's -- I guess it's morality. Like at
14 what point do you decide that what you're producing
15 today, this electricity that we can get from other
16 sources -- as you get me talking about it, like it
17 starts making me angrier and angrier and that we don't
18 need to get the electricity from this source so why are
19 we even talking about it.

20 If there was no other source of electricity I
21 would still have some difficulty. But when there are
22 multiple other sources of electricity and multiple ways
23 of conserving energy and just different ways of running
24 all kinds of systems that we have, that consume vast
25 amounts of energy and electricity then why are we



1 discussing this? Like if we don't need it, like...

2 THE CHAIRMAN: Let me just pick up, not to
3 pursue it, but I think I've grasped the first point
4 you're making on this, to my mind, the very difficult
5 matter of risk. Certain activities of the earth you
6 feel you understand them well enough that you can make
7 some sort of a judgment as to whether you personally
8 want to run that risk or not, and that may be from
9 crossing the street or smoking a cigarette or what have
10 you, but that in certain other areas it just isn't
11 possible for many members of the public to have a
12 sufficient understanding therefore you look to some
13 trustworthy person to try and give you some advice as to
14 what would be a reasonable explanation of the risk which
15 is entailed in certain activities or processes. Is that
16 the --

17 MR. TAYLOR: I guess I would agree, basically
18 agree with that. Again using nuclear if --

19 THE CHAIRMAN: I got your main point. That
20 you don't think this is a wise way to produce
21 electricity.

22 MR. TAYLOR: That's number one, but number
23 two, I don't think the studies that the nuclear folks
24 have put out have been valid scientifically in many
25 cases either.



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1 Like when a person like me has no information
2 about nuclear energy until you read and read and read
3 and maybe I read all the wrong sources, but it seems to
4 me there was enough questions raised and even I can
5 raise some questions about it, that somewhere along the
6 line there's been a snowjob about nuclear energy and
7 that's what's got us.

8 Like, you know we heard first of all there
9 was not supposed to be, what, one nuclear plant go out
10 in I forget what study it was that said it's so far in
11 the future that we'd never hear about and within, what,
12 about three years we had two of them go. Well, if you
13 take the study that was done to reassure us that it was
14 safe and then look at the actual facts, you know, people
15 are trying to predict the future -- that kind of
16 prediction it seems to me was -- that was bad as soon as
17 it was made and now I'm scared. Like who do I trust?

18 THE CHAIRMAN: Question of trust. Okay.

19 Thank you. I apologize for leading into that
20 broader field but --

21 MR. TAYLOR: It's quite okay.

22 THE CHAIRMAN: -- the concept is important, I
23 think, for all of us to try and grasp.

24 Thank very much, Mr. Taylor.

25 MR. TAYLOR: Thank you.



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1 ---Mr. Taylor withdraws

2 THE CHAIRMAN: The next and the final person
3 I have on the list so far, though there may be others
4 who have registered since this was made up for me, Mr.
5 Jim Harding who would like to speak on behalf of the
6 International Uranium Congress.

7 PRESENTATION BY MR. HARDING:

8 Thank you very much.

9 Mr. Chairman and Panelists and fellow friends
10 and citizens of Regina, my name is Jim Harding and I'm
11 presenting these questions and concerns for the scoping
12 stage of the FEARO Panel on behalf of the International
13 Uranium Congress.

14 This group is part of an international
15 network of environmental, peace, development and energy
16 organizations. Our broad objectives have been endorsed
17 by over 160 organizations in 22 countries, including
18 ones from eight Canadian provinces and territories and
19 about 60 organizations in Saskatchewan.

20 The countries that we're involved in
21 networking with are primarily the uranium producing and
22 consuming countries, which means nuclear power countries
23 because they are the ones consuming uranium. So we
24 obviously have a great interest in this process.

25 As I proceed, I think you'll see that many of



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1 our questions are about the question of acceptability
2 and credibility as well as, I do want to perhaps pay a
3 little more attention to the socio-economic questions
4 that have been addressed to this point. But I should
5 state that I think I could say that on behalf of this
6 organization we would strongly endorse the kinds of
7 questions that Maisie Shiell has raised and I won't go
8 into those because Maisie has raised those so clearly.

9 At the start we have questions that I think
10 are questions about acceptability and credibility
11 arising from the hearings being held in Saskatchewan and
12 I realize that the review is not site specific, but
13 Saskatchewan is the only province where hearings are
14 being held which does not directly contribute to nuclear
15 reactor waste or have an active waste -- nuclear waste
16 management project which is the case in Manitoba.

17 Now I'm going to raise a number of questions
18 resulting from this because I think it has a bearing on
19 the question of acceptability and public perception.

20 I've heard two answers to why the hearings
21 are here. One is that we have the mines, which are
22 nuclear mines because they wouldn't exist if there
23 weren't nuclear power plants, and the other is that
24 there's been a proposal to build a nuclear reactor plant
25 in this province.



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1 Well, I'm going to come back to both of those
2 because if in any sense those are reasons, then it
3 raises interesting questions about why the scope of the
4 inquiry isn't larger.

5 Some of us have been calling for more than a
6 decade for a federal public inquiry on the whole nuclear
7 fuel system, and to be an optimist, which I am in
8 regards to human beings, particularly when they're out
9 of power, one would hope your review might be a step
10 towards that full review. That, in fact, you might even
11 consider recommending the need for the full review of
12 the nuclear fuel system because we are all caught in
13 these dilemmas of not being able to talk about the whole
14 problem and public acceptability will only accrue from
15 being able to think clearly about the whole question.

16 Now to reiterate what some others have said,
17 it's certainly the position of this group that I'm
18 speaking on behalf of, as a general position, that no
19 technology, nuclear or otherwise, which does not have a
20 proven waste management system should allowed to be
21 developed in the first place, and I think to follow on
22 principles of ecological sustainability, it's time we
23 said that clearly, and later I will come back to how, in
24 fact, we are beginning to see that that is the practice
25 in some other industries.



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1 In the case of nuclear power, which has been
2 in the works for a full half century, and has
3 continually failed to fulfill its guarantee that a waste
4 storage system is just around the corner, it's our view
5 that the only socially and ecologically responsible
6 thing is to stop the technology so as to not build up
7 even further nuclear wastes as a potential cost, and I
8 think I would add, curse for future generations.

9 At the very least there should be a
10 moratorium on nuclear power in Canada, as suggested in
11 1988 by the Federal Standing Committee on Environment
12 and Forestry, and I probably don't have to remind you
13 that in 1980, the Ontario Royal Commission on Electric
14 Power also said, I think by '85 there should be a
15 moratorium if not just a concept wasn't in place, but a
16 method wasn't in some process of being created, and
17 clearly we're even further back in that thinking in
18 1990, which is somewhat ironic.

19 Now if in any way locating hearings here is
20 because we have uranium mines and after the first brief
21 tonight I began to wonder if maybe somebody's got some
22 eyes on Uranium City - another boom for Uranium City
23 folks - but if in any way someone, somewhere is thinking
24 let's go to Saskatchewan because they have mines and
25 maybe we can dump this stuff down the hole, we could ask



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1 why the handling or mishandling of radioactive waste
2 coming from these uranium mines is itself not included
3 in your terms of reference. Now, I'm obviously not
4 asking you that question, but it seems to me there is a
5 relation.

6 Canada is now the major exporter of uranium
7 in the world, largely because of the large mines in
8 Saskatchewan, which means we are now one of the major
9 reasons why there will be a build-up of nuclear reactor
10 waste, and though the nationalism is satisfying, that
11 was mentioned in the one brief, everyone keeps their own
12 garbage, take the burdens with the benefits, the truth
13 is it's a global system and the exporting of uranium on
14 the scale that's coming out of this province is
15 contributing to a global nuclear reactor waste problem,
16 and we ought to confront that as a moral and an
17 ecological dilemma for people in this province,
18 especially if we don't believe there is an adequate safe
19 way to deal with the waste.

20 Beyond this we already have nearly two
21 hundred million tonnes of radioactive tailings in this
22 country alone, and in the case of Saskatchewan where
23 there's high uranium in the natural ore, and, as Maisie
24 said, quite high levels of Thorium-230 and Radium-226 in
25 the tailings, relative to tailings in Ontario, we might



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1 even argue that they qualify as higher level wastes.

2 The Bayda Inquiry certainly viewed them as exceptional
3 waste that should be isolated from the other tailings.

4 Now even though it's not in your mandate to
5 deal with what I just talked about, obviously you don't
6 have nuclear reactor wastes if you don't have uranium
7 mines creating uranium tailings waste.

8 So even if you can't deal with it directly we
9 would pose some questions for you to explore from the
10 waste management experience with these tailings because
11 you are doing a concept review.

12 For example, we'd ask you to ask the AECL how
13 congruent the actual practices used with uranium
14 tailings have been with the ones presented and supported
15 in the public inquiries. Maisie has, of course, been
16 following this quite closely.

17 We know that some of the higher level
18 tailings which were not to have been put in with the
19 others ended up being put in with the others because the
20 method that was said to be available proved not to be
21 workable.

22 Now that, in the engineering language, might
23 be called correcting yourself as you go, but I'm afraid
24 that it's a more serious question that can also be
25 rationalized after the fact by ad hoc-ery (phonetic),



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1 and I'm sometimes not sure that that's not what that
2 means, ad hoc-ery with a lot of mystified language and a
3 lot of kind of professional elitism too, I might add,
4 which I think is a disturbing part of it.

5 Now it seems to me that even if you can't
6 look at uranium tailings in the waste management
7 practice directly as part of your mandate, you might
8 look at the difficulties that industry, as part of the
9 nuclear industry, has had with its own waste problem.

10 Certainly it is one significant test case of
11 how the front end of the nuclear industry actually
12 performs in contrast to what it says will be its state
13 of the art, fail safe methods. It's a chance to
14 evaluate the value of basing these reviews, public
15 reviews, on idealized and I think public relations
16 models devised by the industry.

17 Certainly the 150 reported spills at uranium
18 mines since 1981 were of the kind that were vehemently
19 denied as ever being possible during the public
20 inquiries, and those of us who sat through those know
21 that quite well.

22 Now the implications for this line of
23 questioning for the AECL and the EIS, I think, are
24 pretty clear. You should be asking the AECL to include
25 in its EIS a complete record of all past attempts at



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1 nuclear reactor waste disposal world wide with a full
2 record of what's been the outcome.

3 Several countries have already tried and
4 abandoned deep rock disposal largely because of movement
5 of underground water waste which is already happening in
6 Canada's underground nuclear reactor waste experiments
7 at Lac du Bonnet. Many countries including the U.S. are
8 looking to more arid locations for storage and I use the
9 word storage intentionally because that's really what
10 we're talking of.

11 I think the AECL should be asked to look at
12 all plans to show us how fantastic have been some of the
13 notions of dealing with nuclear waste.

14 For instance, until recently, there was still
15 talk of disposing, in the U.S., of its hundreds of
16 thousands of tons of reactor waste by torpedoing them
17 into the seabed in the North Sea.

18 The assumption was again along the line of
19 somehow we're going to do better than mother earth.
20 This is a real ego problem. I mean a planet is a
21 planet, you know, and a human or a profession is a human
22 or a profession but certainly we are not equivalent.
23 But certainly the logic in this, it was a crazy logic
24 and thank God the plan has been abandoned, to my
25 knowledge, and I think Norway and Sweden would be



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1 thankful too, that somehow the seabed would encase the
2 radioactive elements so as to slow down their diffusion
3 as the encasement eroded.

4 Now what we know -- now this proves absolute
5 ignorance about ocean ecology, and yet was seriously
6 being considered until two or three years ago. In fact
7 the biologist who was a member of this concept, he was
8 interviewed very recently on CBC Radio.

9 Now there are many others and I'm not going
10 to go into them, but I'd strongly suggest that the
11 committee look at the world information services on
12 energy newsletter from its very beginning simply to get
13 the clippings, the history of clippings of every failed
14 nuclear waste attempt, because they're a group based in
15 Amsterdam that has monitored the world press on nuclear
16 issues and kept track of reporting on what happens with
17 nuclear waste concepts and it might be quite -- in fact
18 I'd strongly recommend that the Panel subscribe to the
19 Wise newsletter, World Information Services on Energy
20 based in Amsterdam. I can pass on the address if
21 necessary.

22 Now to return to the question of whether
23 coming here has anything to do with there being a
24 proposal for a nuclear reactor for this province, well
25 obviously this is an example of having the cart before



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1 the horse.

2 As was shown when the FEARO Panel came to
3 Saskatchewan, I think probably for the last time in
4 1980, to review the proposed uranium refinery outside
5 Saskatoon, I think it's fair to say there's even a
6 deeper opposition in this province to expand the nuclear
7 system and I won't give you examples, but the NDP
8 itself, which oversaw the expansion of the uranium
9 mines, it is now the official opposition, is on record
10 as opposing the construction of any proposed nuclear
11 reactor and supports the phase out of existing uranium
12 mines in the province.

13 Even if the thought that there might be a
14 reactor built in Saskatchewan crossed anyone's mind in
15 deciding to have hearings about reactor wastes here,
16 seems to me we have a right to raise questions about --
17 basically about energy policy.

18 I realize according to your own terms of
19 reference your Panel is to exclude energy policies of
20 Canada and its provinces and the role nuclear power
21 should play in these policies. We are not saying this
22 exclusion is a good thing because we think an inquiry on
23 the whole nuclear system would be advantageous for the
24 public, but certainly if the feasibility of a reactor
25 being built here is a factor in sitting here, then you



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1 are, in a sense, entering into the whole question of
2 energy policy.

3 The separation or the attempt to separate
4 nuclear wastes from what produces nuclear wastes, we
5 find to be - and I don't think we can say it any
6 clearer - to be silly.

7 You can't deal with any waste problem without
8 dealing with the source of production. This has been
9 the preferred approach taken to other waste problems
10 such as PCBs, dioxins, metholmercury and asbestos, to
11 name a few. In some cases safe alternatives have been
12 found to particular industrial toxins and that industry
13 has not been forced to close down.

14 In some cases such as nuclear power, the
15 toxic wastes are inherent to the industry, hence an
16 alternative technology is required. It seems a simple
17 matter of logic. If that is the case then you have
18 every right to ask AECL the implications of moving to
19 energy alternatives such as energy efficiency,
20 conservation and renewables and how the development of
21 these could reduce the use of nuclear power and the
22 buildup of nuclear waste.

23 It seems to me that is a reasonable question,
24 because if we're dealing with 14,000 tonnes as at
25 present or 40,000 tonnes at the turn of the century and



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1 you can keep drawing your curve, it has a different
2 implication in terms of costing and acceptability. I
3 realize we can debate this down to a small amount or a
4 very big amount, but it is a difference in the
5 acceptability and the credibility. Were there to be a
6 stop at 14,000, your task of finding an acceptable way
7 even if it was not a certain way would be fundamentally
8 different.

9 So it seems to me fair to ask what are the
10 implications of moving to energy alternatives, et
11 cetera, et cetera, for reducing dependence on nuclear
12 power and stopping the buildup of nuclear waste.

13 Now nuclear officials have attempted to
14 market their toxic product as the sustainable
15 alternative to fossil fuels and you're bound, of course,
16 to be dealing with this question, even though it might
17 be outside your mandate, and the issue of sustainability
18 has already been raised so I want to expand on that.

19 Even a brisk reading of the Brundtland Report
20 makes it quite clear that nuclear energy was not seen as
21 the way to go. After noting the rising risks of nuclear
22 power - I've given you the pages - the difficulties
23 controlling nuclear weapons, proliferation, the higher
24 than alleged chances of nuclear reactor accidents, the
25 Brundtland Report targets the issue of nuclear reactor



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1 waste. It clearly acknowledged the need to isolate
2 "These from the biosphere from many hundreds of
3 thousands of years that they will remain hazardously
4 radioactive," and it makes no bones about it that, "The
5 problem of nuclear disposal remains unsolved."

6 It says, "The generation of nuclear power is
7 only justified if there are solid solutions to the
8 presently unsolved problems to which it gives rise,"
9 which is a polite way of saying this is not justified.
10 And it states quite clearly that the priority, in terms
11 of sustainability is, "That vigorous promotion of energy
12 efficient practices in all energy sectors and large
13 scale programs of research, development and
14 demonstration for the safe and environmentally benign
15 use of all promising energy sources, especially
16 renewables, be given the higher priority."

17 It seems to me --

18 THE CHAIRMAN: Excuse me, Mr. Harding, I
19 don't know whether you had asked for an additional 10
20 minutes.

21 MR. HARDING: I did.

22 THE CHAIRMAN: Did you? I'm sorry. I wasn't
23 informed of that. Please, you're all right.

24 MR. HARDING: And I'm more than half done.

25 You might wish to explore and ask the AECL to



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1 explore what the implication of following this approach
2 in Canada, the Brundtland approach, would be for
3 reducing the future cost, both ecological and economic
4 of nuclear waste -- nuclear reactor waste.

5 You might also want to ask the Federal EMR
6 which subsidizes the AECL, why they are not pursuing the
7 priorities emphasized by the Brundtland Report on
8 sustainable development. It seems like a legitimate
9 question.

10 There is growing worldwide support for the
11 ecological ethic that wastes for which a safe disposal
12 system is not in place or is not likely to be developed
13 should not be created.

14 Because of the hundreds of thousands of years
15 which nuclear waste will remain hazardous to the
16 biosphere, one cannot really talk of disposal as a
17 viable waste management strategy. One is really talking
18 about permanent storage, and in an ecologically and
19 geologically dynamic world for time periods beyond human
20 historical contemplation.

21 When you really think about it and imagine
22 what's being considered by the AECL, the absurdity and
23 the cynicism is overwhelming. This is why we think
24 there's another agenda which supersedes that of nuclear
25 waste management.



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1 Now, I'm going to jump. Basically we're
2 calling for some common sense, looking at the source of
3 the waste as part of the solution to the waste problem.

4 It's artificial and highly questionable to
5 separate the review of nuclear waste from the nuclear
6 reactors which create them, as though nuclear power is a
7 sacred cow with a privileged status beyond the
8 environmental review process. As though the federal
9 government is so tied to its offspring, nuclear power,
10 that it cannot take a second look at it even in its own
11 environmental review process, and because of this we
12 want to turn to a question that I think relates to the
13 part of your mandate about acceptability, and that's to
14 raise a few questions in conclusion about bias.

15 Your scientific review group seems
16 particularly narrow. Not only are six of the total of
17 13 appointees from an engineering background, but the
18 others are all from the natural sciences. Though two
19 are biologists there are no ecologists in the group.
20 There are no social scientists at all. There are no
21 economists capable of assessing cost benefit analyses,
22 no public policy analysts, no sociologists to address
23 issues of social structure and social change which might
24 be what this is really about. You need a person, we
25 would argue, trained in philosophy and semantics in that



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1 so much of the language used in this controversial area
2 amounts to public relations double talk, and we're
3 serious. A lot of this is about language and discourse.
4 It is not about nuclear waste, and I think if you're
5 going to deal with acceptability and credibility that
6 dimension will have to be looked at.

7 Clearly the issue of nuclear waste does raise
8 many societal and ideological problems in addition to
9 the difficult geological ecological and engineering
10 ones. Yet they seem to have been given little
11 significance.

12 Other kinds of bias have been operating,
13 which I think have a bearing on the credibility, and I
14 won't go into this, but I should point out that a number
15 of people in Regina were concerned that when you came
16 through on the open house, that part of the travelling
17 display was the AECL and Ontario Hydro, and if you were
18 to separate the review process from energy policy,
19 people found it rather strange, there was Ontario Hydro
20 with demonstrations of how nuclear power plants worked.
21 I suppose to balance that people could have requested a
22 renewable energy, non nuclear waste producing design or
23 display in the same room to give, if you like, a more
24 balanced picture.

25 On the whole question of socio-economic



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1 impacts, there is also the question of bias that enters,
2 and credibility, and, I suppose, acceptability
3 ultimately, and I will just briefly deal with this.

4 Even in some of the publications of the
5 Panel, we sense there is a socio-economic
6 predisposition. For example, the questions that were
7 listed in the second issue of -- or Volume 1, Issue 2 of
8 dialogue on the socio-economic issues to be considered
9 by the FEARO Panel, the first two questions posed deal
10 with the possibility of increased employment from AECL's
11 nuclear waste facility. They both use the more
12 deterministic word "would."

13 The third question posed deals with the
14 possibility of negative economic impacts. In this case
15 the less deterministic more probabilistic term "might"
16 is used.

17 The next two questions - I'm only giving you
18 a couple of examples. The whole thing is spelled out in
19 the brief - the next two questions posed deal with a
20 possibility of increased demand for local products,
21 services and housing. The more deterministic term
22 "would" is used again.

23 The next two questions posed deal with a
24 possibility of an increase in population specifying
25 professional and scientific staff.



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1 What we're saying is the bias is already
2 taking shape in the kinds of questions that are posed.
3 Four of the first five questions posed, you're already
4 painting a picture of benefits from economic growth.
5 This picture would obviously be quite attractive to
6 depressed communities facing serious unemployment, out
7 migration, and a weakening local economy.

8 Though the AECL proposal and FEARO Panel are
9 theoretically not to be site specific, we all know there
10 are many such communities in the Cambrian Shield where
11 local elites and politicians would look upon the picture
12 presented by these questions in mostly positive terms.
13 The very asking of these questions in this manner
14 carries a clear message.

15 Now I will move -- you have other examples of
16 that, but I want to pose some additional socio-economic
17 questions. Why are there no questions posed about the
18 capital cost of such job creation? About the loss of
19 economic benefits to other communities due to this
20 capital intensiveness, or about the effects of the worry
21 about nuclear waste over many generations on the morale
22 and quality of life of the people in this region,
23 hypothetical region, or about whether communities facing
24 a depressed economy would even consider such a facility
25 if alternative economic and social development paths



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1 were emphasized, more sustainable ones, or whether the
2 creation of such a facility will make it more likely
3 that other countries, perhaps even those importing
4 Canadian uranium, will send their nuclear reactor wastes
5 here for disposal. Global cost effectiveness. We hope
6 you won't rule these sort of questions out of order
7 since that would simply assure that the overwhelming
8 bias towards the AECL persists.

9 On the basis of earlier reports, about 2,500
10 person years of employment which might result from the
11 50 years needed to begin and end deep rock storage, even
12 taking what would likely prove to be a great
13 underestimation of the cost, being \$7 billion - this was
14 the figure given by the AECL in an interview - we end up
15 with a figure of 2.8 million dollars per job. This is
16 obviously not a cost effective way to create employment
17 except, perhaps, for those in the AECL already facing
18 unemployment due to the lack of demand for their toxic
19 products. Doesn't it make more sense to put this kind
20 of investment into alternative technologies which don't
21 produce waste?

22 Now the point is, something will have to be
23 put into the 14,000 tonnes, but if the waste buildup
24 isn't stopped a heck of a lot more capital will have to
25 be put into the problem and not be available maybe to



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1 move in more sustainable ways.

2 I think to conclude, we're concerned that
3 already the narrowing of the mandate and some of the
4 predispositions around benefits and assumption of
5 continuation of the industry will make the process lack
6 credibility to a large part of the public.

7 The underlying conflict of interest which
8 perpetuates this industry will continue to shine through
9 the kind of promotions that it's involved in. The fact
10 that the AECL, a proponent in this FEARO review, and the
11 FEARO review itself both report to the Minister of
12 Energy, Mines and Resources, the minister is known to be
13 pro nuclear and who, interestingly, represents the
14 Manitoba riding which includes AECL's Whiteshell
15 Research Station, makes the process somewhat circular to
16 us and the credibility somewhat questionable.

17 I recognize that the FEARO panel also reports
18 to the Federal Environment Department, and I do not rule
19 out some contradiction in the federal state over how to
20 respond to the mounting ecological crisis. God knows
21 there should be some. However, we know which minister
22 has carried the clout in matters of energy policy, which
23 really what this is about.

24 The fact that the nuclear regulatory system
25 also reports to the Minister of EMR shows just how



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1 incestuous the nuclear industry has become.

2 If the AECB was reporting to the Federal
3 Environment Minister and this FEARO Panel was only
4 reporting to that Ministry, those of us in the
5 International Uranium Congress might have more
6 confidence in the process.

7 Under present circumstances, not only FEARO
8 but the AECB, the nuclear regulator is complicit in the
9 nuclear industry's attempt to expand and leak documents
10 from the AECB to the Treasury Board, reported in the
11 Globe and Mail on May 28th of last year, indicate that
12 the AECB knows itself to play a major part in the
13 promotion of the industry. It will probably come as a
14 surprise to the people of this province that the AECB
15 requested and received 14 new person years of staff and
16 over one million additional dollars to licence "the
17 Candu-3 and new uranium mines in Saskatchewan" which
18 hasn't even been approved.

19 The AECB knows something we don't know
20 perhaps. Perhaps the decision has already been made.
21 The most interesting thing in the AECB document to the
22 Treasury Board was, and I quote, this is the regulatory
23 agency, and I quote, "The marketability of the Candu-3
24 may be prejudiced as it relies on up front licencing to
25 reduce its capital costs to make it competitive." What



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1 this is saying, is that the regulators understand their
2 role to be to help expand the marketability and
3 competitiveness of the nuclear industry. A strange role
4 for regulators indeed.

5 If nuclear regulators can be that complicit
6 with the industry, how can Canadians believe that a
7 FEARO review process, hamstrung by a limited mandate,
8 will provide them with the kind of independence required
9 to finally address the root cause of nuclear waste.

10 Thank you.

11 THE CHAIRMAN: Thank you, Mr. Harding. I
12 appreciate that you --

13 MR. HARDING: Jumped.

14 THE CHAIRMAN: -- had to skim and jump
15 through your presentation. The result may be a somewhat
16 more staccato impression left than you would have
17 wished. I think I certainly wouldn't want to comment on
18 it and it would be improper to do it in any event in
19 this stage but I can assure you that we will want to
20 read it very carefully and take into account the full
21 report and that it will be given the same weight as your
22 presentation, so we'll all be reading that more
23 carefully.

24 It maybe, however, even from a rapid skimming
25 of the material and listening to you at the same time



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1 that some of the members of Panel will some questions
2 they would like to put to you while you're here. Are
3 there such?

4 Dr. LaPierre.

5 DR. LAPIERRE: I have a question regarding
6 your comment on the globality of the problem. Since you
7 indicated in your brief that the waste was being
8 produced globally, do you think that the scope of the
9 problem in controlling it should be on the edges of a
10 global authority?

11 MR. HARDING: Well, we already know nuclear
12 wastes have been dumped in the ocean, and that that
13 method of out of sight - out of mind was used, and I
14 suspect you would need some kind of international
15 convention to enforce retrieving of that, which, it
16 seems to me, should be done quickly.

17 It seems to me that every industry in the
18 world is competing with each other for markets, which
19 puts a bit of a slant on an attempt at some objective
20 reconstruction of what is the magnitude of the problem.
21 People tend, when they're in a highly competitive
22 market, to put their best face forward and to not talk
23 about wastes which we are finally doing 50 years after
24 this industry started up. It seems to me it might take
25 an international body, not like the IAEA that I think



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1 itself has some of the same credibility problems that
2 AECB has, but something that's seen more to the
3 implementing of the sustainable development idea to
4 assess what is the global risk. What has been done,
5 been documented, what's been done and perhaps not well
6 documented.

7 At that level, yes, it's not that different
8 than global warming. I mean it's different in its
9 impact, but certainly we don't want to pretend that
10 we're just talking about risks that might accrue from
11 deep burial and then fissures and water movements
12 bringing alpha emitters to the surface much faster than
13 anyone realized. We also want to talk about oceans, and
14 we want to talk about the whole interdependence of ocean
15 ecosystems.

16 Now the oceans are under a lot of assault
17 from other things as well, but I guess the answer is,
18 yes, because I suspect that we don't know most of what
19 we should know on a global basis about this problem.

20 DR. LAPIERRE: Thank you.

21 THE CHAIRMAN: Other questions?

22 Mr. Van Vliet.

23 MR. VAN VLIET: Mr. Harding, you indicate in
24 your paper that it's noteworthy that several countries
25 have tried and abandoned deep rock disposal for a



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1 variety of reasons. Could you give us which ones?

2 MR. HARDING: Well, my understanding is that
3 even the Germans were looking at this and they had some
4 difficulties with stability of the structure and that's
5 based on actually talking with a West German at the
6 university. So it's something to explore. But my
7 understanding is that the U.S. has also shifted its
8 focus -- well, it's put some money into the Lac du
9 Bonnet, but its domestic focus, I believe, is shifted to
10 areas with less rainfall.

11 They did look at some sites, I believe, in
12 northern Maine, if I'm right, that may not be being
13 explored at this point, but I think if you look at the
14 Wise Newsletter I mentioned there's reference to a
15 number of the West German plans to deal with both salt
16 and deep rock burials in some of their sort of
17 annotations of their news stories. I wouldn't know what
18 other lead to take than the Wise Newsletter.

19 MR. VAN VLIET: Are these being abandoned for
20 technical or social political reasons?

21 MR. HARDING: I'm not sure, but I do think it
22 is probably both, given that the water issues have been
23 raised in a number of reports that just the amount of
24 water that was moving in these systems was far greater
25 than people had expected they'd be dealing with



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1 I have read a report about rubber boots in
2 Lac du Bonnet. I don't know if you've been there. You
3 probably did a tour of it. I think it was Patterson's
4 book, the Manitoba physicist who's done a couple of
5 books on ethropower (phonetic). I think I read in one
6 of his, that is one of the people who raised that there
7 were technical problems, not just local community
8 opposition. I think that's in Maisie's -- it's in the
9 book Maisie actually referred to the reports of that.

10 THE CHAIRMAN: Dr. Wilson.

11 DR. WILSON: I'm interested in your comments
12 around the scientific review group that we've appointed,
13 and a number of people who have made interventions have
14 mentioned the -- you know, the importance of the cost
15 benefit analysis which will certainly be included, and
16 as you know or you may not know, we have perfect freedom
17 to consult widely.

18 What I'd like to ask you, you mentioned here
19 issues of social structure and social change. I mean
20 the very important societal questions which may come,
21 and since this exercise is about identifying questions
22 that we put to AECL, are you able to articulate for the
23 Panel what some of those social structure questions
24 might be?

25 MR. HARDING: Well, as a Euro-Canadian, who



1 has just, I suppose, in my mid-life discovered the
2 cultural bias that came with the immigrants of which I
3 am an offspring, I find it rather strange that we can
4 even sit here and talk about this time span with any
5 semblance of security that there would be any -- that we
6 could predict societal continuity.

7 The cultures that have had ways of attempting
8 to keep tabs on themselves as ecological creatures have
9 been largely decimated on this planted and are only
10 attempting a comeback at this time, with, I think, the
11 support of the environmental movement worldwide.

12 In this province the alliance between the
13 Aboriginal people and the emerging kind of ecology
14 movement is quite strong because the people who are in
15 the environmental movement that is beginning to realize
16 it has to be more than an anti pollution movement. It
17 has to be something that talks about creating
18 sustainable societies, has an immense amount to learn in
19 terms of how do we even keep track of what's happening
20 to us over time periods.

21 I've worked with the Inuit in the East Arctic
22 who have inhabited that quite difficult terrain in terms
23 of surviving for an estimated 5,000 years with some
24 quite incredible cultural skills in terms of keeping
25 track of their dependence on caribou herds and such, and



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1 I don't believe in the dominant culture we have anything
2 like that sense of culture, kinship continuity, and I'm
3 just talking 5,000 years.

4 It seems to me that the toughest questions
5 are questions of history, not questions of engineering.
6 Because the presentation around engineering raised all
7 kinds of societal questions, I was taking notes, and
8 we'd be quite happy to transpose those into societal
9 terms.

10 Are you going to have professional engineers
11 signing the Saskatchewan Code of Ethics as of 1980 there
12 for a hundred thousand years overseeing this? I mean we
13 know very well that that kind of continuity is unlikely.
14 There may not even be engineers in a sustainable
15 society. There may be something else. We're dealing
16 with such a short time span in our sense of going into
17 the future that I think that perhaps we should ask
18 questions of cultural bias and maybe ask how questions
19 of cultural bias. Even our notion of science and
20 technology, which is very short term, probably biases us
21 to think things are easy or more manageable technically
22 than they really are.

23 I suppose to sum up, I know geology is not a
24 predicted science. I'm not dumb. We know ecology is
25 not yet a predictive science, and we certainly know



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1 history isn't a predictive field. Well, there it is
2 folks. If those three are not predictive, we've got to
3 ask some really tough questions about sort of entering
4 into a hundred thousand year contract with unborn
5 generations about monitoring nuclear waste in a
6 particular way.

7 Again, I would say the best way to deal with
8 that uncertainty is to stop creating them and then try
9 to deal with it. Give us the moratorium. Give us the
10 break. Give us the time to think as clearly as we can.

11 THE CHAIRMAN: Other questions?

12 Dr. LaPierre.

13 DR. LAPIERRE: Mr. Harding, I just have one
14 concern and it is your concern I guess about hitting
15 biases by an association of the Panel and really that
16 concerns me because I can assure you that as far as I'm
17 concerned those comments do disturb me, and I guess you
18 have brought forth some interesting observations from
19 the dialogue newsletter. But I just wanted to indicate
20 to you that as far as I'm concerned I'm doing an honest
21 job.

22 MR. HARDING: We're not here to -- this was
23 not said to alienate you or to alienate us from you. It
24 was said because I think you're looking for some insight
25 into the question of acceptability, and I believe that



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1 many people do not distinguish between the AECB, the
2 AECL and your inquiry. Because the nuclear industry has
3 been a closed shop for so long, and that the
4 processes -- the processes that we have in terms of
5 reporting in this province are even more credible - I
6 hate to say that. I hope Devine hears me. He can quote
7 that in the election - but we separated the mine's waste
8 from the Department of Mineral Resources here. It used
9 to be similar as the MR so it reports to environment, so
10 that at least there's the chance to build up some sense
11 of credible autonomous reporting and expertise in a
12 department that has a clear mandate, or ought to have a
13 clear mandate and hopefully some day we'll even have as
14 much influence as Energy Mines and Resources.

15 The trouble is in the federal system it's a
16 mixed-up reporting system and it confuses people. I
17 even had an AECB person agree with me privately at the
18 end of a meeting about two weeks ago that they should
19 report to environment report because he knows he has a
20 credibility problem.

21 So I think you need to know that to be able
22 to ask the questions about when will the public believe
23 that some people are actually trying to look at this
24 stuff to sort it out, and when will they think there's
25 another agenda.



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1 For example, the agenda of the industry
2 trying to convince the public that something is being
3 done to deal with the waste, therefore it's all right to
4 go on expanding nuclear power. Because we know and they
5 know from their own testing that that's their biggest
6 credibility problem.

7 So you're pulled into that environment which
8 is highly loaded and people need to have a sense, and I
9 suppose we will ultimately judge you by your report, of
10 whether you can ask questions that are clearly outside
11 of that incestuous nuclear circle which is a bit
12 circular. I mean it is -- if you take a look at it
13 structurally it isn't a particularly credible system of
14 reporting.

15 DR. LAPIERRE: Thank you.

16 THE CHAIRMAN: No further questions for --
17 one more from Mr. Van Vliet or two if you wish.

18 MR. VAN VLIET: Is there, in your opinion, a
19 safe method of storage at this present time?

20 MR. HARDING: No, but I do want to read what
21 one of our supporters would have said if she had come
22 herself, so that it's clear what our position is. We
23 don't believe there's a safe method and we don't believe
24 that moving to deep, you know, Cambrian storage,
25 certainly with what's presently known, carries enough --



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1 has reduced the uncertainty sufficiently that we'd think
2 that that was the route to go.

3 This is what one of our supporters wanted to
4 say. Store all the waste in visible places beside or
5 near the facility. Check on containers, et cetera, at
6 least twice yearly and make repairs and replacement as
7 needed, report on at least an annual basis to all
8 householders in a 200 mile radius plus all communities
9 downstream or at least as far as the sea. Nuclear waste
10 should not be hidden and should not be transported.
11 There should be no central facility.

12 And I think -- I guess I would encourage you
13 to think of that as a way to go because it's the out of
14 sight - out mind question and the sense that the public
15 thinks somebody is actually dealing with something that
16 could in fact not be dealt with because you're taking --
17 I mean you're making too many assumptions when you move
18 to a so-called permanent storage system.

19 I can't ever imagine geology being a
20 predictive science myself, to be frank, in which case
21 better to keep the stuff visible and monitored. It
22 reduces as quickly as possible how much is created, and
23 do the serious long-term studies, and I mean long-term.
24 It may not be our generation that can deal with this
25 stuff. I don't see it as an ethical dilemma. I think



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1 there's probably more of an ethical dilemma to pretend
2 do to something that really passes the buck, which we
3 might be doing to future generations by saying well,
4 we'll go into it sort of incrementally and ad hoc and
5 we'll build something and we'll put it there and we'll
6 have people keep track of it with the sense in the
7 public that the problem is being addressed and then
8 perhaps stimulate late a growth of more wastes for
9 future generations to deal with.

10 MR. VAN VLIET: So you clearly see the -- it
11 is less of an ethical problem to pass on the waste in a
12 visible place rather than in a place where it --

13 MR. HARDING: Yeah, and I think that's the
14 whole dilemma of a creating a sustainable society, is
15 that we have to recognize that for every product
16 there's -- at present we are a waste producing species
17 and if we don't get the feedback in the process of the
18 benefits we can become, you know -- I suppose our
19 ethical standards can go to the very lowest level, which
20 they have. I mean -- I think that's largely what this
21 is a question of, is raising our social ethics so that
22 we take responsibility for the waste we produce and
23 perhaps stop doing things the way we're doing them, and
24 if we don't have them visible and within our own realm
25 of social benefits it seems to me you can't ever



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1 generate that public responsibility.

2 Plus, I think it's probably better to have it
3 monitored on that basis. Having everything in one area
4 and a major calamity, I suppose you could always say
5 it's something like Chernobyl instead of something else,
6 but there's no guarantees that geological changes don't
7 have implications for multiple ecosystems and we don't
8 know very much about underwater water systems. The more
9 I talk to hydrologists the more I realize it's even --
10 we're better at public opinion polling - can I state it
11 that way - with our sampling then we are at
12 understanding hydrology because of the sampling
13 dilemmas.

14 MR. VAN VLIET: Thank you.

15 THE CHAIRMAN: Thank you very much, Mr.
16 Harding, and I can assure you --

17 MR. HARDING: I have one thing that I would
18 like to leave with you. It's the proceedings of the
19 Congress that we organized in 1988 and it's a
20 publication put out by environmental groups when the
21 last FEARO Panel sat in Saskatchewan in 1980, and you
22 might be interested in having it for your library.

23 THE CHAIRMAN: Thank you very much, and we'll
24 make sure that we make a note of that also in the record
25 of the proceedings, that has been referred to.



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1 MR. HARDING: Thank you.

2 THE CHAIRMAN: Thank you very much for
3 appearing. We will be re-reading what you've written
4 and also what you've said in your presentation today.
5 Thank you for that.

6 ---Mr. Harding withdraws

7 Mr. Harding's name was the last one I had
8 on the list, but I would like to ask now if there is
9 anyone else who would like to address us while we're
10 here. We have a little time available for that. If
11 not, I would like to thank all of you for -- first for
12 being present and particularly those who have taken the
13 trouble to prepare material and to participate in our
14 discussions today.

15 I hope that there is a little bit of tea and
16 coffee left and that you will feel that it's worthwhile
17 to stay and have a little bit of informal chat amongst
18 yourselves and possibly the members of the panel, as
19 informal discussions are frequently of equal benefit to
20 the more formal presentations which we have. So please,
21 if you'd like to stay around a little bit
22 longer do so. You'd be very welcome.

23 Thank you very much indeed.

24 ---Whereupon the scoping meeting adjourned at 9:30 p.m.
25 to resume Tuesday, November 20, 1990, at 7:00 p.m.



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I hereby certify the foregoing to
be a true and accurate computerized
transcription of the proceedings,
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Carla Helman

Carla Helman, C.S.R.

